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Integration of the Internet into the Curriculum: A Model Application Exploring the Iditarod

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INTEGRATION OF THE INTERNET INTO THE CURRICULUM:

A MODEL APPLICATION EXPLORING THE IDITAROD

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by

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ABSTRACT

INTEGRATION OF THE INTERNET INTO THE CURRICULUM:

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This manuscript is intended to serve as a model and resource for elementary teachers seeking to incorporate use of the Internet into their curriculum. A central premise of the document is that the Internet can serve as a valuable learning tool when it is part of an integrated, project based instructional program. A discussion of the rationale supporting this position is provided, as well as a review of related literature and research. Issues and considerations for those developing Internet based curricula are addressed. A sample Internet based curriculum for primary students, "The Spirit of Adventure," is offered as an illustration of exemplary classroom practice. Student roles, activities, and assessment methods are described, along with their connections to core curriculum content, Washington State's Essential Academic Learning Requirements, and the National Educational Technology Standards.

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<u>On-line</u>

Connecting to the Internet via a computer terminal (Norris, 1998).

<u>World Wide Web</u>

The multimedia portion of the Internet, consisting of text, pictures, sound,

animation, and video. Also referred to as "the Web" or <u>WWW.</u>

Chapter II

A Review of the Related Literature

Educators are constantly searching for new ways to motivate students and engage them in meaningful learning. The Internet offers unlimited possibilities towards this endeavor by essentially breaking down the school walls and providing access to people and places far removed from individual students. According to Haury and Milborne (1999) the full potential of the Internet as a tool for learning is still being explored, but one of the main limitations may simply be our imaginations. However, before the Internet's learning potential can be fully realized several obstacles must first be overcome. Oliver et al. (1997), list these obstacles as including a lack of teacher training and a lack of consensus about what constitutes best use. This document seeks to address these obstacles by providing a reference for beginning teachers as well as a definition and model of appropriate Internet use. First the current status of Internet use in the classroom will be reviewed; following that a discussion of how the Internet might better serve classroom practices will be presented. The potential learning benefits of Internet use will be described based on case study research. Appropriate Internet use will then be connected with constructivist practice. Finally, issues for teachers to consider when planning Internet based curriculum will be discussed.

Current Status of Internet Use in the Classroom

In February of 1996, President Clinton issued a challenge to schools and educational leaders to prepare "technologically literate" students by the 21st century. Recognizing the importance of the Internet in the future of education, the

Clinton Government mandated that in order to meet this goal all classrooms should be connected to the Internet by the year 2000, and that all teachers must be trained to integrate this technology into the curriculum (US Department of Education, 1996). Considering the speed at which school change usually occurs, four years was an amazingly short time to complete such a massive undertaking. The year 2000 has arrived and we have not quite yet fulfilled the goal. Incredibly however, the first part of Clinton's challenge has all but been accomplished. According to surveys conducted by the Center for Research on Information Technology, approximately 50% of schools had some kind of access to the Internet in 1996 but by 1999 this number had grown to more than 90% (Becker, 1999). It can be assumed that this number has continued to grow over the recent months and that we are now very close to the 100% goal. Equity issues, which once plagued the technology arena, seem to be diminishing (at least regarding Internet access). Anderson and Ronnkvist (1999), found no significant difference in access levels of schools serving minority or low socioeconomic communities as compared to more affluent schools; this finding differed sharply from similar surveys conducted only three years earlier.

Simply having access to the Internet, however, does not ensure its best use. Equity issues become evident when close scrutiny is given to the way in which the technology is applied. Becker (1999) discovered that only 26% of elementary teachers involved their students in Internet based activities. Of these activities 92% involved downloading of research information. Only 8% involved more interactive applications such as e-mail, web publishing, simulations, and

problem solving. According to Doherty (1998) a large number of expensive Internet connections lie dormant in schools except for brief periods when they function only as a very convenient encyclopedia.

Much of the reason for this under use of the Internet could be the location of the computers with connections. Anderson and Ronnkvist (1999) discovered that more than 80% of Internet ready computers are located in computer labs or libraries. This makes it very difficult for the classroom teacher to readily access the technology and integrate Internet activities into everyday classroom projects, or to utilize the technology for spontaneous learning opportunities. It also places a heavy burden on library and media specialists to ensure that the resource is shared equitably (Sunal, Smith, Sunal, & Britt 1998). According to Sunal et al. the ideal situation for Internet based activities is for a teacher to have several computers in the classroom so that it can become an ordinary part of instruction. Johnson (1998) suggests at least one computer for every four students. Sadly very few elementary classrooms meet this ideal. Currently the national average is one computer for every nine students (Becker, 1999), however only a small percentage of these have Internet connections.

Another reason for the under use of the Internet reflects the fact that the second part of Clinton's goal, that teachers will be prepared to integrate Internet technology into their curriculum, is far from being achieved. Hubbard (1998) and Sunal et al. (1998) both cite a lack of proper training and follow-up support as the most frequent reason teachers give for not using the Internet in their classrooms. According to Hubbard, most teachers using the Internet in innovative and

creative ways have done so through a process of experimentation, born out of personal interest, and in the absence of any formal training. Harris (1998) tells us that while such innovators may naturally seek out creative avenues for using the Internet, the majority of teachers, and especially the "technophobes," need specific training and ongoing support in learning how to incorporate the technology effectively. School districts have spent billions of dollars putting the infrastructure in place to allow for Internet access and have had little left in the budget to pay for staff training (Sherry, 1997). According to Johnson (1998), staff development must now take priority if the financial investment in infrastructure is ever to pay off. If we are to rise to Clinton's challenge of preparing a technology literate student population, current trends in Internet use must be altered. This can only be achieved through teacher training in best practices.

<u>Moving Towards Best Practices in Internet Based Curriculum</u>

Sunal et al. (1998) identify five levels of Internet use, with the higher levels being most reflective of best practices. Teachers using the Internet to gather lesson plans and resources would be said to be working at a level one. If and when these resources are shared with students to augment curriculum, Internet use shifts to level two. Level three is achieved when students themselves work on the Internet as part of an existing lesson. Level four occurs when teachers construct new curriculum and projects not possible without use of the Internet. At level five the students construct their own projects; their learning and use of the Internet is self-directed. As documented above, most of the current Internet applications in schools occur at levels one, two, and sometimes three. Only a

relatively few innovators are using the Internet at a level four or five (Sunal et al.). However, the literature appears to be unanimous in stating that working at these higher levels must be the standard to which all teachers should strive if the Internet is to achieve its full potential as a learning tool (Doherty, 1998).

As stated earlier, Doherty (1998) warns against the Internet becoming a passive learning technology by serving only a lower level information retrieval function. This is not to downplay the value of the Internet as a research tool. Indeed one of its most powerful functions is to provide access to sources typically beyond the reach of students and teachers alike (Parker-Roerden, 1997). Through the Internet students have access to libraries, databases, museums, government offices, satellite data, and experts in the field. The Internet also fosters an appreciation of the multifaceted nature and complexity of any one topic. Being able to link across sites exposes students to the multiple perspectives that surround issues (El Hindi, 1998). Another powerful characteristic of the Internet is its timeliness; information is updated continually and where textbooks become outdated quickly, the Internet is a source of real-time information. For example, learning becomes much more powerful when students can look up the actual temperature in the Arctic at that precise moment and then monitor its changes over time, as opposed to reading statistical averages from a text (Willis, 1998). Also important is the possibility of bringing equity to the resources that individuals have available to them. (Berenfeld, 1996). In the past a considerable source of inequity between schools was rooted in the differences between the amount and quality of library resources they could

afford. Through the Internet, assuming they have a connection, all schools no matter what their budget or demographic profile, have access to the same amazing variety of resources.

The use of the Internet as a research resource is indeed an invaluable tool for the classrooms of the 21st century. However, if teachers are to move towards working at the higher levels of Internet use, and if the true learning potential of the Internet is to be realized, additional aspects of it must be employed. Berenfeld (1996), Greening (1998), Harris (1998), and McDonald, Garties, Hanson, Slygh, and Schroeder (1996) identify five domains of Internet activities in addition to research, that facilitate work at levels four and five described above. They are; interpersonal exchange, information analysis, publishing, virtual field trips, and collaborative problem solving.

<u>Interpersonal Exchange</u>

"The greatest value of the Internet is in its ability to connect people" (Oliver et al. 1997, p 5). It allows them to enter into a dialog with people, places, and ideas that would normally be beyond their experience. The Internet facilitates interpersonal exchange or communication in a number of ways. Many Internet projects use electronic mail as the common context for exchange (Harris, 1998). The Internet also allows for real time communication through video conferencing and "chat rooms." Conversation can be one-to-one or one-to-many. Example Internet activities involving interpersonal exchange include, Keypals, electronic mentoring, and global classrooms.

Keypals are the online version of regular pen pals (Harris, 1998). As students correspond with their pal they engage in authentic literacy experiences and forge a deeper appreciation for the perspectives of others (El Hindi 1998). Students can debate their interpretations of such things as topical news events or cultural traditions and thus broaden their perspectives of these issues. El Hindi describes a project in which Japanese and American children shared their important family traditions and helped to brake down the stereotypes each group held about one another.

Electronic mentoring "occurs when experts in a specific field respond to student questions and provide resources beyond textbooks and the individual teacher's expertise" (Berenfeld, 1996, p21). For example, the US Geological Survey runs an on-line project entitled "Ask A Geologist." Here students studying geology can E-mail questions and receive answers from professional geologists. According to El Hindi, this kind of activity helps students to see how their learning is connected to the real world and models the idea that learners collaborate in order to solve problems.

Global classrooms connect two or more groups of students studying the same topic. The groups share what they learn and compare notes (Harris, 1998). As in Keypal activities, the goal is for students to recognize that there are multiple perspectives to an issue. Parker-Roerden (1997) describes a project involving students researching the civil war history of their local community and then constructing a day in the life of a fictional resident during that period. These

vignettes were then shared with others over the Internet and the differing experiences and lifestyles were compared.

Information Analysis

Information analysis builds upon the research application of the Internet. It involves students in using research data to construct new knowledge (Berenfeld, 1996). Students compile and compare different types of information from the Web and then create some kind of database or product (Harris, 1998). Ballinger (1999) describes a project involving students from around the country collecting data about water quality in their area. This data was shared over the Internet. Students then researched and compared the physical and industrial features of each location and generated possible causes of poorer water quality. These kinds of activities involve students in higher-order thinking skills including analysis, synthesis, and evaluation of data.

Publishing

Another interactive function of the Internet is the ability to publish student work for the enjoyment and use of others in the community and around the world. According to Berenfeld (1996) Internet publishing authenticates student learning by placing their work in the context of the real world. Students increase their sense of self-efficacy when their work is received and responded to by an audience. Furthermore, they tend to invest more effort if they know their work is going to be available for public scrutiny. Publishing not only provides validation for the student author, it also provides motivation and follow up project ideas for the audience (Harris, 1998). There are countless examples of student work

already published on the Internet; Berenfeld cites the "Writers in Electronic Residence Project" where students of all grade levels publish their poetry for feedback from peers around the world.

Virtual Field Trips

Virtual field trips allow students to experience events at remote sights (Berenfeld, 1996). The Internet can literally take students in unlimited directions; around the world, to the top of Everest, to the bottom of the ocean, into space, back into history, ahead into the future, and even into Wonderland. While the virtual experience cannot replace actual first hand experience, it can sensitize students to a whole range of experiences previously beyond their reach (Bellan & Scheurman, 1998). Virtual field trips range in complexity from a photographic tour of the Mayflower, to a real time exploration of the Ocean floor through a remote robot operated by students participating in the "Jason Project" (Berenfeld).

Collaborative Problem Solving

According to Harris "Problem solving is one of the most beneficial educational opportunities that we can offer students of any age, and the Internet can be used to extend cooperative problem solving around the world" (1998, p. 35). Collaborative problem solving activities combine all of the elements described above and channel them towards some kind of shared goal (McDonald et al. 1996). Internet based problem solving projects are the least common kind of activity occurring at the elementary level, yet they represent activities at the highest levels of Internet use (Sunal et al. 1998). Two kinds of collaborative problem solving activities are simulations and social action projects.

Simulations involve groups of students in solving problems created in virtual worlds. Students act and react as if they were participating in a real world event (Parker-Roerden, 1997). Examples include students planning and taking a virtual trip down the Amazon river. They must research the territory and then design a boat, decide on supplies, and plan for the unexpected, all based on their research information. Students begin their virtual journey and must keep a log as the trip unfolds. According to Harris (1998) online simulations require a great deal of set up and maintenance, but the payoff in depth of learning and task engagement usually convinces project organizers that the effort was worthwhile. Harris (1998), Morden (1996), and Tillman (1998), all refer to simulations as the most powerful vehicle the Internet has to offer for building student motivation and depth of learning.

Social action projects serve as a way for students to apply their learning towards meaningful contexts that can contribute to the betterment of the human experience (Harris, 1998). The goal of a social action project is for students to develop a pluralistic attitude and feel empowered to be agents of change in society (Parker Roerden, 1997). Examples include fifth grade students investigating the proliferation of land mines, bringing this to the attention of others on the Internet, and collaborating to raise funds for mine diffusion (Bellinger, 1999).

These six domains of Internet use, research, interpersonal exchange, information analysis, publishing, virtual field trips, and collaborative problem solving, do not occur in isolation. An Internet project may include aspects of

many or all of them. What is important about each of them is that the focus of attention is on sharing and applying information, problem solving, and the learning process. It is not on finding the correct answer, memorizing a set of facts, or learning a variety of technology skills (Harris, 1998). No matter which domain an Internet activity falls within, a focus on process rather than skills must drive instructional decisions (Dede, 1998). This focus on process rather than skills can often make lesson plan design difficult for beginning teachers. They are unsure of how processes connect with desired outcomes (Harris, 1998). In other words teachers are unsure what kind of processes lead to the desired skills they want children to know. A survey of the literature, particularly Berenfeld (1996), Greening (1998), Johnson (1998), Rice and Wilson (1999), and Tillman (1998), reveals seven common criteria that should guide process oriented Internet based curriculum design. They all state that activities should be; constructive, authentic, collaborative, integrated, employ multiple resources, foster commitment, and most importantly, they should be content driven.

Constructive Activities

The word "constructive" refers to the fact that students and teachers should be active participants in Internet based activities. In other words, some kind of response or change in thinking should be necessitated by the activity (Greening, 1998). Internet activities should empower students in a way that allows them to construct their own knowledge rather than reproduce somebody else's (Tillman, 1997). This speaks to Doherty's (1998) assertion that the Internet should be an active learning technology. Greening warns us that an Internet

activity is "trivial if it is not the sort of interaction that evokes cognitive restructuring" (1998, p. 30). He goes on to say that "when [the Internet] become more desirable to students on the basis of its fancy trimmings than its learning benefits, it is more likely to be due to bad pedagogical design" (p. 30).

Authentic Activities

Authenticity refers to the fact that Internet activities should make connections to real world issues and to problems of emerging relevance (Greening, 1998). Activities should be anchored on children's own experiences and interests. The Internet exposes students to raw data and primary sources which support this endeavor but which may be complex for young children. The teacher's responsibility is to provide "scaffolding" in support of the students and help them make connections in their learning (McDonald et al. 1996). Publishing work on the web also promotes a sense of authenticity as students begin to consider their work in terms of an audience.

Collaborative Activities

In the past, working with computers has often been an isolating activity. Students typically worked individually or in pairs on word processing or skill and drill software. The Internet is a computer activity that lends itself to collaborative functions (Haury & Milbourne, 1999). Cotton (1998) stresses the term "collaborative" rather than the more commonly used "cooperative." She believes that cooperation suggests such things as turn taking and compromise, whereas collaboration suggests parties working together to achieve synergy. Synergistic outcomes are the hallmark of level four and level five Internet activities (Sunal et

al. 1998). Students work together either in person or across great distances to construct, compare, and reflect on data. Their understanding is deepened because of the opportunity to share the experience with others.

<u>Integrated Activities</u>

The Internet provides a vehicle for teachers to design cross-curricular projects (Cotton, 1998). For example students working with the curriculum to be presented in chapter four of this document will be reading data collected from the Internet as well as fiction and non-fiction material. They will be writing as they record their data and will also be involved in e-mailing and web publishing. Mathematics and science will be integrated as they explore issues relating to survival. Social studies will be included as they learn about a geographic region and its native culture. Building cross-curricular projects enhances students' ability to make connections in their learning and enhances authenticity (Johnson, 1998). Johnson points out that much of the current Internet use occurs in the social studies arena and encourages teachers across the other disciplines to investigate ways in which it might enhance their programs.

<u>Employing Multiple Resources</u>

The Internet should never be thought of as replacing traditional resources such as texts, encyclopedias, expert interview, and personal experience. The Internet should serve to supplement and extend these resources (Sherry, 1997). According to Humes (1999) schools and teachers must recognize that their goal is not simply to prepare children who are technology literate, but who are information literate. She defines this skill as the ability to "access, evaluate,

organize, and use information from a variety of sources" (p. 3). Being information literate requires an understanding of how and where to find information, the ability to judge whether the information is meaningful and reliable, and the understanding of how to apply that information to the problem at hand. The Internet provides an opportunity to hone these skills but it is only one piece of the puzzle.

Fostering Commitment

The idea that Internet activities should foster commitment speaks to teacher responsibilities for building student participation and engagement. First a teacher should not begin a project that he or she does not have the time, resources, or expertise to bring to closure (Cotton, 1998). Secondly, the activity must build on student interests or have an engaging hook that motivates them to participate. In order to build student motivation, the teachers themselves must model enthusiasm and believe that the project is a worthwhile undertaking (Willis, 1998). Allowing projects to be student directed gives students more autonomy in their learning and generally encourages greater commitment. Sunal et al. (1998) believe that if level four and five projects are to be successful the teacher must give up his or her traditional role and instead become a facilitator of student directed activities.

Content Driven Internet Activities

Content driven activities are those that are developed in harmony with learning objectives and that provide a vehicle for skill development. This is the most important aspect of project development (Greening, 1998), (Johnson,

1998), Kaufman, (1998). These authors caution against the temptation to assign projects that use an exciting new technology but that have little curricular value. Educational needs, instructional goals, and state standards should drive all curriculum decisions. It is the educator's responsibility to look for ways the technology can enhance desired learning or make it easier.

Using the above criteria to develop higher level Internet based projects involving interpersonal exchange, information analysis, publishing, virtual field trips, and collaborative problem solving, has the power to deepen learning. When best practices of Internet use are applied, the elementary curriculum can be responsive to differing learner interests, can provide authentic opportunities for application, and can motivate students to learn.

<u>Learning Benefits of Internet Activities</u>

There has been a great deal of recent focus on the use of Internet in schools and the literature is saturated with anecdotal discussion about the potential benefits of this new technology. Surprisingly however, there has been relatively little experimental research done to investigate the impact of technology on student learning. Many research studies have investigated such topics as Internet access, equity, and teacher attitudes, but these do not answer questions about the kind of learning that takes place when Internet technology is utilized. An extensive review of the literature revealed only one study comparing the quality of learning that occurs when Internet is added to the curriculum with the kinds of learning that takes place in its absence. Bryant (1998) compared two similar fifth grade classrooms each studying the civil war. Only one of the

classrooms had access to the Internet and the teacher incorporated use of this tool into a variety of activities. The Internet work in this classroom fits the description of a level four activity as described above. The researcher compared the behavior of the two groups of students during the activities and assessed their learning both formally and informally at the end of the unit.

During the unit the main differences between the two groups was in their levels of motivation and on-task behavior. The students working with the Internet demonstrated "tremendous enthusiasm and were actively engaged with tasks for much greater periods of time" (p. 62). Students working with the Internet also displayed an ability to work independently requiring only minimal assistance form the teacher. At the close of the unit the students were assessed in a variety of ways. They each produced a written report or project and were given a criterion referenced test covering the material they had learned. The researcher also questioned students to uncover their knowledge of the topic. No significant difference was noted in the scores of the two groups on the test; each group had mastered the required core concepts equally well. However differences were uncovered when the individual work was assessed. The students who had used the Internet had to synthesize a wider variety of resources into their work and therefore tended to understand topics in much greater depth. Their work also employed a more expansive vocabulary. Concerns about plagiarism were more of an issue with the group who did not use the Internet; they tended to copy sentences from the text. The researcher suspects that those using the Internet had so much more information at their disposal which generated ideas about

what to say without the need for plagiarism. The researcher was most convinced about the benefits of Internet use by his interviews with the students. Those who had used the Internet were more animated and thoughtful in their responses and entered into debates about the issues. The group who had not used the Internet tended to "spout back only the facts that they had memorized" (p. 63).

Perhaps many of the differences that Bryant describes could have been due to other variables such as teacher style and student characteristics. But even when viewed with caution these results at least suggest that the Internet contributes positively to learning. Taken at face value they wholeheartedly support the beliefs of the many Internet supporters, and experts in the field, who have been quoting anecdotal evidence of the power of this new technology to effect learning. Berenfeld (1996), El Hindi (1998), Johnson (1998), McDonald et al. (1996), Oliver et al. (1997), Sherry (1997), and Tillman (1998), all speak to the potential learning benefits of the Internet. Their findings are summarized below.

1. Through the Internet students have unprecedented access to resources, primary sources, and raw data. This increases the authenticity of the learning environment and brings real world relevance into the classroom. A rich source of resources also allows students to delve deeper into topics of interest.

2. The Internet serves to promote higher-order thinking because students will spend less time looking for information and more time analyzing it. The Internet allows teachers to focus curriculum around primary concepts as opposed to discrete facts. Projects and activities necessitate cross-curricular activities and this helps students see connections in their learning.

3. When students work on Internet based projects their collaborative skills are enhanced as students work together with classmates, on-line mentors, and other learners towards a group goal.

4. Literacy is fostered as students read and write in authentic contexts. Other basic skills are practiced and developed through cross-curricular Internet projects and investigations.

5. Students develop an understanding of the multifaceted nature of primary concepts as they are exposed to a variety of sources and perspectives on an issue. This helps students to appreciate that knowledge is constructed and that individuals have different understandings.

6. Motivation and engagement are increased. Students actively participate in their learning and feel a sense of autonomy. This translates to greater commitment and on-task time.

While it is true that these benefits might be reaped by other more traditional instructional strategies, the Internet is unique in that it packages them in one medium (Tillman, 1998). There is much consensus in the literature regarding the power of the Internet to effect learning, but many of the authors argue that in order for these benefits to be fully realized there must be a shift from current instructional practices to those more consistent with constructivist philosophy.

Constructivism and the Internet

Introduction of the Internet into the classroom has raised the interest of constructivist theorists and educators. According to Mc Donald et al. (1996) they see the Internet not only as a tool to expand learning opportunities but also as something that will revolutionize teaching and prompt educators to embrace constructivist pedagogy. The domains of Internet activities, the criteria for developing activities, and the list of potential benefits described above, do indeed read like a chapter from a constructivist text book and they are more than compatible with constructivist pedagogy.

Constructivism assumes that individuals construct knowledge and that they are active and curious in this process. The Internet fosters such activity and curiosity as students interact with it in unlimited directions (El-Hindi, 1998). Constructivism believes in presenting learning in terms of big ideas rather than discrete facts, and in exposing students to primary sources. The Internet allows students to explore such sources in the context of authentic investigations (Rice and Wilson, 1999). Constructivists hold that the role of the teacher is one of facilitator, providing scaffolding to students as they work within what Vygotsky described as the Zone of Proximal Development. Internet projects of the kind described above necessitate the teacher relinquishing their traditional roles and allowing students to be more self-directed in their learning (McDonald et al. 1996). Finally constructivists believe that learning is a socially mediated experience. The Internet allows for collaboration and social interaction beyond the boundaries of the classroom (Berenfeld, 1006).

The parallels between constructivist practice and what has been defined as effective Internet applications are extensive. The question is whether use of the Internet will prompt objectivist teachers to become constructivist facilitators. McDonald et al. (1996) point out that teachers are much more likely to use any technology in service of their existing practices rather than adjust their philosophies or established pedagogy. This may be true in the short term, however a number of authors predict that use of the Internet in the classroom will eventually lead to school reform of the kind never before seen (Greening, 1998). Greening predicts that this will occur when the generation raised with the Internet become teachers themselves. Whether school wide reform occurs as a result of the Internet remains to be seen. What is clear is that "for teachers who have a difficult time relinquishing top-down authority over the learning process, the road to successful Internet integration will be a bumpy one indeed " (Willis, 1998, p. 19). The Internet can be used by traditional teachers in service of existing pedagogy. However, it is this author's position, in consensus with the many authors cited above, that the true potential of the Internet can only be realized when constructivist principles are embraced.

In truth, most teachers are more concerned with day-to-day issues of managing a classroom than they are with philosophical issues. They want to know how such technology can help them achieve their goals and they want answers to logistical and management questions.

Issues for Teachers

Regardless of their philosophy, all teachers planning to implement Internet based activities in their programs must answer a variety of questions that will impact their instructional decision-making (Willis, 1998). These include; questions about how to design appropriate Internet based activities, questions about how to align effective use of the Internet with district learning objectives and standards, questions about how to protect students from uncensored and undesired material, questions about what kinds of skills their students will need, questions about how to manage the classroom, and finally, questions about how to assess student learning. Questions about how to design appropriate Internet based activities can be answered by following the criteria described above. The remaining problems are discussed below.

Aligning Internet activities with Curricular Goals and Technology Standards

In 1998 the International Society for Technology in Education released national educational technology standards for K-12 students. Known as NETS, these standards describe the technology skills expected of all students, along with benchmark performance indicators. Most school districts have now adopted these standards as their own (Roblyer, 2000). These standards are presented in full in chapter four. In addition to NETS most states now have implemented content areas standards. In Washington State these are the Essential Academic Learning Requirements or EALRs (Washington State Commission on Student Learning, 1996). These various, and sometimes competing, objectives make lesson design a challenging task for even the most experienced teacher (Harris

1998). Harris suggests that designers first follow existing curriculum and established projects such as the one presented in chapter four of this document. This helps them gain experience and sensitizes them to the issues involved in lesson design. As they begin to develop their own curriculums. Cotton (1998) suggests that teachers construct curriculum overviews in the form of graphic organizers, these provide a visual reference allowing teachers to check that all desired content area and technology skills are covered. As stated earlier, content must always drive instructional decision-making.

Safety on the Internet

According to Oliver et al. (1997) a fear of students gaining access to undesirable material is a central reason why many teachers and parents have not embraced the use of the Internet in classrooms. Collins (as cited in McDonald et al.) makes an interesting point by arguing,

> "Fearmongers think that the Internet is not a safe place, to which I counter that field trips are even more dangerous. Censors want to restrict students' use of the Internet instead of teaching them the skills to screen out the material that is inappropriate" (1996, p. 102)

This having been said, fears about inappropriate Internet use are a legitimate concern for educators. Many school districts have installed software that serves to screen out undesirable material, but these are easily circumnavigated and often cause frustration by inadvertently preventing access to innocent material (Teicher, 1999). Norris (1998), Reum (1998), and Teicher all agree with Collins in that it is essential to explicitly teach children to use the Internet safely and

responsibly. According to Teicher these topics need to be the subject of ongoing discussion and modeling. Central to this effort is the creation of an acceptable use policy. Acceptable use policies clearly state the rules of Internet use so that they are clear to everyone. They provide guidance about what to do if a student encounters inappropriate material and limit the school's legal responsibilities (Reum). All children using the Internet, even those as young as Kindergarten, should understand and sign an acceptable use policy, and should be familiar with the consequences that will occur if they break it (Norris). Many school districts have already designed such policies. However, individual teachers may want to construct their own according to specific classroom needs and use them in addition to those required by the district. Teicher reminds teachers to share with their students the fact that "ethical behavior in the electronic world is as important as ethical behavior in the physical world" (p. 71).

Skills Required for Internet Use

In order to work successfully with the Internet some technology skills are required. Taken together, these skills are described as technological literacy (Moran, 1997). The national educational technology standards (International Society for Technology in Education, 1996) provide some guidance as to the types of skills appropriate at each developmental level. However, Robyler reminds us that "these technology skills should not be goals in themselves. They should be a natural outgrowth of the role technology plays in teaching and learning" (2000, p. 136). Kozma and Shank (1997) agree and argue that skill development should be promoted only to the degree that it serves authentic

applications of the technology. In other words these authors believe that teachers should devote instructional time to teaching discrete skills such as keyboarding, navigation, and search strategies only as they become necessary in the course of regular content-based activities.

Besides being technology literate, students need to have a variety of skills in place in order to operate successfully on the Internet. McDonald et al. (1996) list these as organization, patience, and reading. Students who have not learned how to organize and prioritize materials and ideas will have a difficult time sorting through the confusion of the Web. Students who lack patience may find it difficult to persevere when searches become complex or when information takes time to download. Students who do not yet read independently may find the Internet, which is still primarily text based, overwhelming and hard to navigate. While the authors agree that these skills can be practiced and enhanced through interaction with the Internet, they propose that alternative media might better serve the instructional needs of such students.

The most important skill that students will need in order to work effectively on the Internet is Information literacy (Humes1999). As already stated, Humes defines information literacy as knowledge about how to "access, evaluate, organize, and use information from a variety of sources" (p. 3). Information literacy is critical if students are to evaluate the reliability and worthiness of web resources. Reynolds and Plucker (1999) point out that a distinguishing feature of the Internet is that anyone can publish without the stringent editing that occurs with more traditional media. Children must therefore be sensitized to the fact that

not everything in print is truth. Information literacy is another skill that can and should be taught within the context of authentic activities on the Internet (Reum, 1998). When teachers undertake Internet based activities they must explicitly teach children how to recognize reliable sources and evaluate the content of the documents they download (Norris, 1998).

Management Issues

Management issues connected with Internet use will largely be related to the teaching style of the individual teacher, his/her comfort level with the medium, the context of the activity, and knowledge about the behaviors of specific individuals and groups of students (Harris, 1998). The greatest variable in the classroom is the teacher. Internet activities depend upon the same sound instructional and management practices as any other classroom endeavor. However, there are certain elements from the literature that relates specifically to Internet activities. For example, Cotton (1998) suggests ensuring that all computer monitors face outwards so that the teacher can see the screens. Acceptable use policies may tell students what is expected of them but teachers must actively ensure that they are behaving appropriately. Cotton also suggests that teachers always do preliminary searches of topics in order to acquaint themselves with the kinds of things their students will encounter. Teachers can bookmark quality sights to give students a starting place for their own investigations. Reum (1998) suggests that students keep a web sight log to help with organization and to build accountability into the process.

Assessment of Internet Based Activities

Assessment strategies need not change because of the adoption of Internet based activities. Teachers can still give tests at the close of projects if this fits with their instructional plan. However, concerns about plagiarism suggest that assigning written reports may no longer be an accurate way to measure student knowledge. Though in the study sighted above Bryant (1999) found more concerns with copying amongst students who used a traditional text, the fact remains that teachers have a difficult time knowing whether a paper represents a student's own work or has been copied verbatim from a Web page (Sherry, 1997). According to Sherry the Internet lends itself to portfolio assessment, wherein students may be asked to write a paper or produce a product, but also are required to turn in rough drafts and copies of Web pages used as resources. In this way the students and teacher have a record of the genesis of the project as well as materials that document growth and progress. Multimedia projects particularly complement Internet based activities. Students can directly transfer graphics and sound from the Net into their projects. A benefit of such projects is that they are already in a form that can be directly published on the Internet (Cotton, 1998). When non-traditional assessment strategies are employed rubrics will be needed. These must be created at the stage of project design so that students know precisely what the expectations are for successful completion of the project.

In summary, Internet technology when used appropriately, and in a variety of domains, has the potential to enhance learning. It can act as a medium for

students to debate and exchange ideas, and a place where they can explore topics in greater depth than ever before possible. Through the Internet students can experience learning environments far removed in time and place, and can share their learning with the world. Appropriate Internet activities can be described as constructive, authentic, collaborative, integrated, employing multiple resources, fostering commitment, and content driven. Teachers should design projects that include a variety of activities from each of the domains of Internet use. Furthermore, curriculum design based on constructivist pedagogy is most likely to harness the potential learning benefits of the Internet. When successful project design is accomplished the rewards include increased student motivation and engagement.

Chapter IV

A Guide for Teachers in the Development of Internet Based Activities

The guide contained in the following pages is designed as a stand-alone document to be used by teachers in the field.

Integrating The Internet Into

The Elementary Curriculum

A Model Application Exploring the Iditarod

This guide is written with the assumption that interested teachers are already connected to the Internet and have a grasp of basic navigation skills and terminology. Activities are presented in outline form, presuming that both novice and experienced teachers possess the knowledge necessary to set up and manage the various activities, and to interpret the theory and rationale underlying pedagogy. Teachers are encouraged to personalize ideas according to their individual needs.

An Introduction to the Internet

The Internet can serve as a valuable teaching and learning tool when part of an integrated, project based instructional program. This guide will help you to develop appropriate Internet based activities that serve to engage learners and deepen understanding of concepts.

Why Use the Internet in your classroom?

Many benefits associated with Internet based activities have been documented. These include, but are not limited to, the following.

- Unprecedented access to resources, primary sources, and raw data.
- Development of higher-order thinking skills through collaboration, analysis and synthesis of data.
- Development of collaborative and social skills.
- Opportunity to develop literacy and basic skills in an authentic context.
- Fostering of appreciation for the multifaceted nature of issues.
- Increased motivation, engagement, and on task time.

Levels of Internet Use

Five levels of Internet use have been identified in the literature. The goal for educators should be to create level four and level five projects.

- Level 1 – Teacher researches a topic and gathers resources to aid in teaching.
- Level 2 –Teacher shares Internet resources with students to augment existing curriculum.
- Level 3 – Students work on the Internet as part of an existing lesson.
- Level 4 – Teachers construct new curriculum and projects around Internet activities.
- Level 5 – Students design their own Internet projects.

Domains of Internet Activities

There are six types or domains of Internet activity. These activities do not occur in isolation; usually, effective projects combine two or more of them.

1. Research activities: When students research a topic on the Internet they have virtually unlimited access to primary sources and raw data.

2. Interpersonal exchange activities: These types of activities involve some kind of communication over the Internet. This could take the form of keypals, correspondence with experts in the field being studied, or collaborative work with other classrooms and individuals.

3. Information analysis: These types of activities involve students in some kind of synthesis or evaluation of data. A student generated product or database is usually the result of this kind of work.

4. Publishing: Students have the opportunities to post their work on the Internet for public viewing and feedback. In this way students themselves contribute to the pool of knowledge.

5. Virtual field trips: Through the Internet students can experience events beyond the boundaries of the classroom. Virtual field trips range in complexity but all serve to sensitize students to a whole range of experiences previously beyond their reach.

6. Collaborative problem solving: These activities combine all of the elements above and channel them towards some kind of group goal. Simulations and social action projects are examples of this kind of work.

Identifying these domains within project plans will help you ensure that your activities reflect a balanced variety of Internet activities. Use the following graphic organizer to help with this endeavor. As you develop a curriculum plan, plug in each lesson or activity. A good curriculum will have a balance of each of the types of activity.

	Activity 1	Activity 2	Activity 3	Activity 4	Activity 5
Research					
Interpersonal Exchange					
Information Analysis					
Publishing					
Virtual Field Trips					
Collaborative Problem Solving					

See page 61 for a completed example constructed for the sample curriculum.

<u>Curriculum Design</u>

<u>What Makes A Good Internet Based Curriculum?</u>

Seven criteria for effective Internet based activities have been established. Activities need not meet all criteria but they should at least meet one. All criteria

should be reflected in the project as a whole. According to the criteria, activities should be . . .

1. Constructive: Students and teachers should be active participants in the activity. Some kind of response or change in thinking should be necessitated.

2. Authentic: Activities should make connections to student interests, real world issues, and problems of emerging relevance.

3. Collaborative: Activities should bring students together to debate, reflect on, and generate new knowledge. Synergy should be a goal of Internet activities.

4. Integrated: Activities should cross disciplines and provide a vehicle for developing core content and skills.

5. Employ multiple resources: The Internet should not be the only resource utilized in the activity.

6. Foster commitment: Activities should be constructed so as to engage learners. Teachers must model enthusiasm and a commitment to the activity.

7. Content driven: Internet activities must be designed around instructional objectives and the learning needs of the students. Use of technology is a tool not an educational goal.

<u>Aligning Internet Activities With Content area Thrusts</u>

Content area goals must always drive Internet activities. It is important to identify the key content area skills and concepts to be developed during any Internet project. In most states standards have been developed that specify key learnings expected for all children. In Washington State these are the Essential Academic Learning Requirements or EALRs. It is helpful to construct a checklist of content goals to serve as a graphic organizer. This can provide a quick reference for you, administrators, and parents, as you justify your curriculum decisions

The checklist on pages 55-58 reflects the EALRs that are developed, practiced, and refined through participating in the following curriculum. You are encouraged to construct your own graphic organizers according to individual state and district standards.

<u>Aligning Internet Activities With Technology Standards</u>

As stated above, content objectives must drive instructional decision-making. However, working on the Internet provides an important opportunity to develop, practice, and refine important technology skills. The International Society for Technology in Education has developed National Educational Technology Standards or NETS for all students. Knowing what is expected of learners will enable you to plan activities that foster these skills. Another graphic organizer can serve to make this task easier. The example below reflects the NETS that specifically relate to Internet activities. Again, plug in each activity as

you develop curriculum and ensure a balance of activities. See page 59 for a

completed example.

	Activity 1	Activity 2	Activity 3	Activity 4	Activity 5
Demonstrates proficiency in use of technology					
Students practice responsible use of technology systems					
Students use productivity tools to enhance learning					
Students use telecommunications to interact, collaborate, and publish					
Students use technology to locate and collect information					
Students evaluate new information and resources					
Students use technology to solve problems and make decisions					

You must become familiar with district and state level content standards,

as well as the technology standards. Only then will you ensure that your lesson

designs reflect these goals.

Lesson Design in Five Easy Steps

1. Identify a topic. Ideally this will be based on student interest, contemporary issues, or district requirements. The topic should be broad to allow for students to select specific areas of interest within the theme.

2. Search the Internet. Get an idea of what's out there that could be a resource for both you and your students.

3. Identify key activities within the various domains of Internet use that are suggested by the topic.

4. Use the graphic organizers to ensure a balance among the types of activities, content area thrusts, and technology skills.

5. Outline expectations for students. Create assessment strategies and rubrics.

Assessment Strategies

Assessment methods will depend on the specific project and the content area goals you are working towards. However, in general, performance assessment of student products is the best way to evaluate Internet based activities. You will need to create your own rubrics according to your lesson design. Sample student projects and assessment rubrics are provided on pages 68, 87, and 90.

Getting Started on The Internet With Students

A Word About Safety

Many teachers and parents have concerns about students gaining access to inappropriate materials on the Internet. Parents must be informed of your intentions to use the Internet in your classroom and must give their permission, in writing, for their child to participate. It is vital that you discuss ethical and safety issues with students and make clear your expectations. It is a good idea to role-play what students could and should do in the event they find themselves in an inappropriate situation on the Internet. All students should understand and sign an acceptable use policy or AUP. AUPs state the rules of internet use so they are clear to everyone. They provide guidance about what to do if a student encounters inappropriate material and limit the schools legal responsibilities. Students should also know the consequences that will occur if they break the AUP agreement. Below is an AUP designed for students as young as Kindergarten. It is adapted from that described by Norris (1998). You may want to adjust the AUP for older elementary children and adolescents.

I am using the Internet at school. I agree to only go to Web sites that help me in my learning. If I come across an inappropriate Web site I must tell the teacher immediately. If I intentionally visit a Web site that does not help my learning, I understand that I will loose my computer privileges.

Signed _____ Date _____

Developing Information Literacy

Information literacy is the knowledge about how to access, evaluate, organize, and use information from a variety of sources. This is a crucial skill in Internet based activities because of the sheer number, and unedited nature, of Web resources. Evaluating the reliability and worthiness of Internet sites is a skill that must be explicitly taught. One way to evaluate a site's quality and reliability is to scrutinize the host or sponsoring agent. This information is located in the URL or Web site address of each Internet page. For example, the Web site "www.kcts.org" contains the host code org. This indicates that the site is sponsored by a non-profit organization; in fact this is the site belonging to a public television station. Teach children to look for sites that contain the host codes "org," "edu" for educational institutions, and "gov" for government agencies. These all tend to be sources of reliable information. Host codes such as "com" for company and "net" for network indicate that the host is a private enterprise. This does not mean that the information is any less reliable, just that it should be scrutinized more closely. Advertising and promotion are also far more likely to be present on these sites.

Teaching students to evaluate Web sites should be an activity embedded into all Internet projects. The following is a checklist that second grade students and above can use as they learn these skills. It is adapted from one described by Reum (1998). If students discover they have checked "no" more frequently than "yes," they may want to consider choosing an alternative resource.

Checklist For Evaluating Web Sites

Site URL:

Where did the Information come from?

Is it clear who sponsors the page?	yes	no
Is the purpose of the sponsoring organization clear?	yes	no
Is the author of the information listed?	yes	no
Is the author someone well known?	yes	no
Are the author's qualifications stated?	yes	no

Is the Information Accurate?

Are the sources of information listed?	yes	no
Is the information free of spelling and other errors?	yes	no
Are charts and graphs clearly labeled and easy to read?	yes	no

Is the Information Objective?

Is the information presented as a public service?	yes	no
Is the Information free of advertising?	yes	no
Is the information trying to change your opinion?	yes	no

Is the information Current?

Are there dates on the page to tell when it was written?	yes	no
Does the page tell when it was last updated?	yes	no

Is the Information Complete?

Is the page finished and not "Under Construction?"	yes	no
Does the site have the information you need?	yes	no

Is the Information Understandable?

Is the site easy to use?	yes	no

Management Issues – Rules for the Road

- Always conduct preview web searches to acquaint yourself with the kinds of resources students are likely to come across. Bookmark a few sites to give students a quality starting place.

- Turn monitors outwards so that you can see what students have on their screen. Monitor students closely when they are surfing the Net.

- Have students keep a log of Web sites they visit; this builds accountability and strengthens organizational skills.

- Set aside a specific Internet time on a regular basis so that students can plan ahead and use their computer time efficiently.

- Enlarge the font on your browser to aid beginning readers.

Implementing the Curriculum

The following sample curriculum is designed to be implemented within the confines of the regular classroom. Ideally a classroom will have more than one computer station with access to the Internet though this is not required. Students can rotate through the activities in small groups. Teachers whose only Internet access is via a library or computer lab will have a very difficult time implementing these guidelines.

You may use this curriculum as is as a great stating place for Internet activities in your classroom, or you may use it as a guide for developing your own projects. The curriculum focuses on third grade students but could easily be adjusted for other grades.

The Spirit of Adventure

An Internet Based Curriculum for Third Grade

Why Study Adventures?

The need for an integrated Internet based project has been described, but why use adventures and adventurers as a topic? The Internet is literally jam packed with wonderful learning opportunities that could be used to enhance a variety of content areas. The answer to this is simple. Children love adventures. This highly motivating topic has the power to take children around the world, to the top of Everest, to the bottom of the ocean, out into space, back into history, forward into the future, and even into Wonderland.

Focus Questions and Key Ideas

The curriculum involves the students in the investigation of adventurous episodes of the past, present, and future. There are three guiding questions with which the students will grapple

- What does it mean to be an adventurer and what are the characteristics of an adventure?
- What is it about the human experience that makes some of us crave adventure?
- What are some of the ethical dilemmas that arise and can they be addressed?

In their attempt to answer these questions for themselves, it is hoped that the students will gain some insight into the following ideas . . .

- Having an adventure means having an experience that takes you outside of your comfort zone. This can mean different things to different people. One person's adventure may be another's routine.

- Students are adventurers in the expedition of learning.

- Big adventures get all the attention, but small-scale adventures, such as those the students might undertake, are just as personally fulfilling.

- An adventurer's sense of identity is shaped by their adventure.

- Adventurers don't usually succeed if they are unprepared. Adventures take careful planning, training, and a strong support network.

- Adventures are not usually an individual activity. Adventurers rely on team-work. They often have a crowd of unsung heroes helping them behind the scenes.

- There are hazards involved in many adventures. People (and animals) can get hurt. There are ethical dilemmas involved that sometimes cannot be resolved.

Project Goals

To provide the students with an opportunity to develop, practice, and refine content area skills and concepts in a motivating and authentic context.

To provide an opportunity for students to develop, practice, and refine technology skills.

Outline of Activities

The project takes place in three phases. Each phase builds upon the preceding one so that students can undertake more complex activities and apply their new knowledge at each step.

In the first phase the whole group investigates an adventure expedition together. The Iditarod has been selected because it is a yearly event that is predictable, and is represented on the Internet in real-time. It is also a motivating topic for students. However, any adventure expedition could be substituted according to current adventure events or specific areas of interest. During this first phase the teacher models learning strategies, and gives the students a framework with which to explore and understand the concepts. Phase one is a level four Internet activity.

In the second phase the students apply the learning framework and strategies of phase one to an independent investigation of their own choice. Students should work on this activity in small groups. This is also a level four activity.

In the third and final phase, the students apply the principles employed previously to plan, participate in, and record their own adventure. This adventure takes the form of a virtual simulation on the Internet. This is a level five activity.

In all phases of the investigation students are expected to develop, practice, and refine a variety of skills. Many of these skills require explicit instruction and careful monitoring by the teacher. For example, students will be reading a variety of non-fiction informational texts and resources. Instruction in

specific strategies for such reading should be embedded into the fabric of the investigation. This document does not include plans for how to accomplish this because it will depend so much on the needs of individual students. However, when such a skill or strategy is called upon within an activity, it is implied that the teacher should provide the necessary support.

The project ends with the opportunity for students to share their learning as they role-play an adventurer at a World Conference of Adventurers. Parents are invited to listen to describe their expeditions and pose questions. All student work will be published on the Web.

Materials Required

The sample curriculum is designed to be implemented within the classroom. Ideally a classroom will have more than one computer station with access to the Internet though this is not required. Teachers whose only Internet access is via a library or computer lab will have a very difficult time implementing these guidelines.

A variety of additional technology will enhance the learning experience. Printers, scanners, and multimedia software will allow students to construct presentations reflecting their learning. It is also helpful to connect the computer monitor to a television. This can be accomplished with a variety of technologies. Newer computers are likely to have "FireWire" connections that allow direct hook up to the television. Older computers will probably require some kind of mediating technology such as a Tvator. Projecting the computer screen onto the

television allows more students to view the screen clearly and from greater distances. It allows for whole group activities around the computer which is helpful for demonstrations such as introducing a Web site or modeling a computer skill.

A variety of text and video resources and Internet Web-sites are referred to in this curriculum and most are required for this project. A complete list is presented on page 95.

Preliminary Activities

If you plan to publish student work on the Internet you will need to set up a web page. A number of software packages are now available that make this possible without having to translate text into HTML, the language of the Internet. Web publishing is an important piece of the puzzle in fostering a sense of authenticity and collaboration in the project.

If you plan to invite other classrooms and individuals to join you in your studies you must post an advertisement for your project on the Web some time before you plan to begin your project. There are several sites that are set up for classrooms to canvas for collaborators; the most popular is Kidlink, at www.kidlink.org.

Each student will need a folder in which to keep his or her Adventure work. They will also require a journal.

Activity EALR Connections

EALR	Description	Activity 1	Activity 2	Activity 3	Activity 4	Activity 5
Reading 1	The student understands and uses different skills and strategies to read				*	*
Reading 2	The student understands the meaning of what is read.		*	*	*	*
Reading 3	The student reads different materials for a variety of purposes		*	*	*	*
Writing 1	The student writes clearly and effectively.	*		*	*	*
Writing 2	The student writes in a variety of forms for different audiences and purposes.	*		*	*	*
Writing 3	The student understands and uses the steps of the writing process.	*		*	*	
Writing 4	The student analyzes and evaluates the effectiveness of written work.	*		*	*	
Math 2	The student uses mathematics to define and solve problems.					
Math 5	The student understands how mathematical ideas connect within mathematics, to real-life situations.					
Comm. 1	The student uses listening and observation skills to gain understanding.	*	*	*		
Comm. 3	The student uses communication strategies and skills to work effectively with others.	*	*			
Science 2	The students knows and applies the skills and processes of science and technology..					
Geography 1	The student uses maps, charts, and other geographic tools.					
Geography 2	The student understands the complex physical and human characteristics of places and regions.					
Geography 3	The student observes and analyzes the interaction between people, the environment, and culture.					
History 1	The student examines and understands major ideas, chronology, and relationships in U.S. history				*	

EALR	Description	Activity 6	Activity 7	Activity 8	Activity 9	Activity 10
Reading 1	The student understands and uses different skills and strategies to read	*		*	*	*
Reading 2	The student understands the meaning of what is read.	*		*	*	*
Reading 3	The student reads different materials for a variety of purposes	*		*	*	*
Writing 1	The student writes clearly and effectively.					
Writing 2	The student writes in a variety of forms for different audiences and purposes.	*		*		
Writing 3	The student understands and uses the steps of the writing process.					
Writing 4	The student analyzes and evaluates the effectiveness of written work.					
Math 2	The student uses mathematics to define and solve problems.		*	*		*
Math 5	The student understands how mathematical ideas connect within mathematics, to real-life situations.		*	*		*
Comm. 1	The student uses listening and observation skills to gain understanding.	*			*	
Comm. 3	The student uses communication strategies and skills to work effectively with others.		*			
Science 2	The students knows and applies the skills and processes of science and technology..		*	*		
Geography 1	The student uses maps, charts, and other geographic tools.	*	*			
Geography 2	The student understands the complex physical and human characteristics of places and regions.	*	*	*		
Geography 3	The student observes and analyzes the interaction between people, the environment, and culture.	*				
History 1	The student examines and understands major ideas, chronology, and relationships in U.S. history					

EALR	Description	Activity 11	Activity 12	Activity 13	Activity 14	Activity 15
Reading 1	The student understands and uses different skills and strategies to read	*	*	*	*	*
Reading 2	The student understands the meaning of what is read.	*	*	*	*	*
Reading 3	The student reads different materials for a variety of purposes	*	*	*	*	*
Writing 1	The student writes clearly and effectively.		*		*	
Writing 2	The student writes in a variety of forms for different audiences and purposes.		*		*	
Writing 3	The student understands and uses the steps of the writing process.		*		*	
Writing 4	The student analyzes and evaluates the effectiveness of written work.					
Math 2	The student uses mathematics to define and solve problems.					*
Math 5	The student understands how mathematical ideas connect within mathematics, to real-life situations.					*
Comm. 1	The student uses listening and observation skills to gain understanding.	*	*	*	*	*
Comm. 3	The student uses communication strategies and skills to work effectively with others.	*				
Science 2	The students knows and applies the skills and processes of science and technology..					*
Geography 1	The student uses maps, charts, and other geographic tools.					
Geography 2	The student understands the complex physical and human characteristics of places and regions.	*				
Geography 3	The student observes and analyzes the interaction between people, the environment, and culture.	*				
History 1	The student examines and understands major ideas, chronology, and relationships in U.S. history					

EALR	Description	Activity 16	Activity 17	Activity 18	Phase II	Phase III
Reading 1	The student understands and uses different skills and strategies to read	*		*	*	*
Reading 2	The student understands the meaning of what is read.	*		*	*	*
Reading 3	The student reads different materials for a variety of purposes	*		*	*	*
Writing 1	The student writes clearly and effectively.		*	*	*	*
Writing 2	The student writes in a variety of forms for different audiences and purposes.		*	*	*	*
Writing 3	The student understands and uses the steps of the writing process.		*		*	*
Writing 4	The student analyzes and evaluates the effectiveness of written work.		*	*	*	*
Math 2	The student uses mathematics to define and solve problems.	*			*	*
Math 5	The student understands how mathematical ideas connect within mathematics, to real-life situations.	*			*	*
Comm. 1	The student uses listening and observation skills to gain understanding.		*	*	*	*
Comm. 3	The student uses communication strategies and skills to work effectively with others.	*	*		*	*
Science 2	The students knows and applies the skills and processes of science and technology..	*		*	*	*
Geography 1	The student uses maps, charts, and other geographic tools.				*	*
Geography 2	The student understands the complex physical and human characteristics of places and regions.			*	*	*
Geography 3	The student observes and analyzes the interaction between people, the environment, and culture.			*	*	*
History 1	The student examines and understands major ideas, chronology, and relationships in U.S. history				*	*

Activity Connections to NETS Standards

	1	2	3	4	5	6	7	8	9	10
Demonstrates proficiency in use of technology			*	*	*	*	*	*		*
Students practice responsible use of technology systems		*	*	*	*	*	*	*	*	*
Students use productivity tools to enhance learning										
Students use telecommunications to interact, collaborate, and publish	*								*	
Students use technology to locate and collect information				*	*	*	*	*		*
Students evaluate new information and resources			*	*	*	*	*	*		*
Students use technology to solve problems and make decisions										

	11	12	13	14	15	16	17	18	II	III
Demonstrates proficiency in use of technology	*	*	*		*	*	*	*	*	*
Students practice responsible use of technology systems	*	*	*		*	*	*	*	*	*
Students use productivity tools to enhance learning	*								*	*
Students use telecommunications to interact, collaborate, and publish	*	*		*		*	*	*	*	*
Students use technology to locate and collect information	*	*	*		*	*		*	*	*
Students evaluate new information and resources	*				*			*	*	*
Students use technology to solve problems and make decisions					*	*		*	*	*

Internet Activity Domains

	1	2	3	4	5	6	7	8	9	10
Research			*	*	*	*	*	*		
Interpersonal Exchange			*							
Information Analysis				*		*		*		*
Publishing	*									
Virtual Field Trips									*	
Collaborative Problem Solving										

	11	12	13	14	15	16	17	18	II	III
Research	*	*	*		*	*			*	*
Interpersonal Exchange	*	*		*	*		*	*	*	*
Information Analysis	*					*			*	*
Publishing				*					*	*
Virtual Field Trips	*								*	*
Collaborative Problem Solving									*	*

Phase I: The Iditarod

Activity1: <u>Creating a Shared Understanding</u>

Content connections: Writing for a variety of purposes including reflection.
                         Communicating ideas through discussion.
Internet domain: Publishing
Technology Skills: Web Posting
                         Web Publishing
Materials Required: None

Before beginning an investigation it is important to bring the students

together to make connections to their existing knowledge and to generate a

shared understanding of what is to come.

Discuss with the students that they are going to begin an investigation of

adventures using the Internet as a tool. Ask them to think about the most

adventurous thing they have ever done and write about it. This could be a

homework assignment. You may also want to share a personal anecdote to

create an anticipatory set. When they have written their stories students should

share their ideas. Their responses will be varied and may indlude:

A ride on a scary roller coaster   Climbing the rock at REI
Going Hiking   First time on an airplane
Tasting an exotic food   A trip to a foreign country
Diving from the high board

Encourage the students to ask questions of one another about their

adventures. Model some appropriate questions, such as . . .

What made you want to do that?
How did you feel?
What was the most difficult/scary/exciting part?
Would you do it again? Why?/Why not?

Guide the students to the idea that all of these adventures have had an

important effect in shaping each person. None of their stories are any more or

less adventurous because they are so important to the individual. Their written work can be bound into a book so that students can read and re-read each other's stories throughout the investigation. Their work can and should also be published on the web.

Post student work on the Internet together with the question "What is the most adventurous thing you have ever done." Ask for feedback using KidLink and see what responses you get back.

An alternative activity would be for students to interview family and friends about their most adventurous activities and report their findings.

Activity 2: <u>Creating A Working Definition</u>

Content connections:	Reading a variety of texts for differing purposes
	Interpreting and responding to texts
	Building vocabulary
	Communicating ideas through discussion
Internet domain:	N/A
Technology connections:	N/A
Materials Required:	The book: <u>If You Seek Adventure</u> by Fulvio Testa

Creating a shared working definition of the concept is an important step to provide the context for future investigations.

Now that students have shared their personal stories they can help to generate a definition of what an adventure is. This can be uncovered by simply asking the question, "What is an adventure?" Their definitions may look something like this . . .

An adventure is…
  A daring deed
  When you try something new

Exploring
Exciting and Challenging
When you do something brave
When you go somewhere you've never been before

Read the book If You Seek Adventure. Each page and picture has a

hidden deeper meaning, use them as discussion starters. Guiding questions

might be . . .

What tools are the children carrying with them that they might need on an
adventure?
Why is it important to share your adventures with friends?
What does the author mean when he says, "Jump and leave the ground
for a while?"
"Where is the adventure in "growing, being kind to friends, and just
being?"

After reading the book, students may want to add to their definition of adventure.

Activity 3: Introducing the Iditarod and Zuma

Content connections: Reading for a variety of purposes
                          Building Vocabulary
                          Communicating ideas through discussion
                          Communicating with others for a variety of purposes
                          Investigating the cultural features of a region
Internet domain: Research
                          Interpersonal Exchange
Technology connections: Keyboarding
                          Web site navigation
                          E-mailing
Materials Required: The video Iditarod
                          WWW.iditarod.com

Discuss with the students that they are going to follow an adventure called

the Iditarod sled dog race. Ask the students to share what they already know

about this event and dog sledding in general.

Show the video Iditarod. This video is fast paced and exciting and is sure

to generate student interest in the topic. Now that students have had a glimpse of

what the Iditarod is all about you need to connect it to what they have already discovered, and to what they are going to be investigating in the future. Guiding questions might be . . .

What makes the Iditarod and adventure?
What are you most interested in learning more about?

Some vocabulary building will be necessary. Words such as musher, rookie, and trail, may be new to students. Iditarod and adventure related vocabulary can be charted on word walls for later use in writing activities.

Now is the time to introduce the students to the official Iditarod Web site and Zuma – www.iditarod.com. Zuma is a canine Iditarod reporter who provides daily updates before and during the race. Zuma is particularly appealing to students. Her reports are a mixture of lighthearted insights from a doggy point of view, and news items or important events that have occurred during the day. She gives daily weather reports and trail conditions and describes how these factors are affecting the race. All vital information if students are to truly appreciate the difficulties faced by the racers. Following Zuma's reports gives the students a whole new perspective on what is going on. Her focus is on the dogs, not the mushers. She tells stories of the various team dogs, particularly the leaders. Many of these dogs are celebrities in their own right in Alaska. Zuma also writes personal e-mail to students in response to their questions. She encourages them to keep rooting for the mushers and engages them with some kind of question or problem.

If possible connect the screen to the television, allowing the whole group to view simultaneously. Show the students the various links and how to navigate around the site. Read Zuma's messages and get to know her.

Allow time for the students to explore the site independently. At this point, and at any point during the race, they can E-mail Zuma. Students will probably want to e-mail Zuma frequently. Remind them that it is not reasonable to expect a busy canine to respond to several e-mails from the same person when so many children are writing to her. Encourage them to limit their e-mailing to times when they have legitimate questions about the race. To show respect to the reader, all e-mails must be taken through the entire writing process. Young students may need a framework to work from.

E-mail to Zuma

Include:

A sentence telling why you enjoy reading her reports.

A sentence that shows you know a lot about the Iditarod.

A question or comment about the race.

A sentence that tells her she's appreciated.

A thank-you.

Your name and age.

Activity 4: <u>Researching the History of the Iditarod</u>

Content connections:	Reading a variety of texts for differing purposes
	Researching, paraphrasing and summarizing
	Analysis and synthesis of information
	Writing for a variety of purposes
	Immersion in historical events
	Comparison of historical fact with historical fiction
Internet domain:	Research
Technology connections:	Internet site navigation
	Downloading resources
	Word Processing
Materials Required:	The book, <u>The True Story of Balto</u>

Information regarding the history of the Iditarod can be found on the official Web site as well as in a variety of texts presented in the resource list.

The Iditarod celebrates the art of mushing, which until very recently served important economic functions in Alaskan society. The most famous mushers were those that in 1925 delivered life saving medicine to Nome in the middle of a bitterly cold storm. The Iditarod runs the same trail used by those heroes of the past.

The students can research the history of the Iditarod, as well as the gold rush that brought Westerners to Nome in the first place. The students can then read the story <u>The True Story of Balto</u> and look for the ways in which this story has altered, and embellished upon, historical fact. Guiding questions might be:

Who were the real heroes of Nome and are they getting the attention they deserve?
Why do you think the story was not told in a historically accurate way?

The last page of the book shows a picture of a family reading a newspaper article about the medicine run. A favorite way for students to demonstrate their learning is for them to construct their own newspaper article recording the actual

historical events. If these are printed on newsprint they can be pasted on to pages from a current newspaper so that they resemble published articles.

Following is a rubric, based on six trait writing competencies, which can be used to assess these articles.

	Accomplished	Emerging	Beginner
The article reports historical facts accurately.			
The article is clear and focused.			
The article is structured and organized appropriately. E.g. using chronology.			
The writer uses headlines and lead sentences to draw the reader in.			
The writer uses expressive language.			
The writer applies conventions where appropriate.			

Activity 5. <u>Selecting Mushers to Support During the Race</u>

Content connections: Reading a variety of texts for differing purposes
Researching, paraphrasing and summarizing
Writing for a variety of purposes including reflection
Communicating ideas through discussion
Understanding perspective and motivations
Internet domain: Research
Technology connections: Internet Site Navigation
Materials Required: Student recording sheet.
www.iditarod.com

The students will each choose two mushers to follow throughout the race. Many mushers do not complete the race so by choosing more than one musher, the students have a better chance of seeing at least one of their mushers finish.

The students should browse through the musher pictures and biographies on the official Iditarod Web site and choose two mushers that appeal to them. Then, using the web based musher biographies, together with information from mushers' individual web sites (if they have one)and text resources, the students must complete the musher biography sheet about each one. If this activity is undertaken more than two weeks before the race start the students can e-mail their musher and expect a response. Mushers do not respond to e-mail in the days immediately preceding, or during, the race.

As students look through the biographies they will notice a large number of women competitors. There is also an enormous age range amongst the racers. This provides an opportunity for discussion and reflection.

Why is the Iditarod one of the few sports were women compete against men and younger people compete against those much older?
Of what other sports is this true/not true? Why?
There is no gender or age limitation on being an adventurer.

Musher Biography

paste musher
photo here

Name of Musher: _____

Age of Musher: _____ Race Number: _____

Name of Lead Dog: _____

Where they live: _____

Iditarod Rookie: yes / no – If no, what happened to them

the last time they ran the Iditarod? _____

_____

What made them want to be a musher and run the

Iditarod? _____

_____

A fascinating fact about this musher: _____

_____

I chose this musher because . . ._____

_____

Activity 6: <u>Investigating Alaska</u>

Content connections:	Reading a variety of texts for a variety of purposes
	Reading informational texts
	Researching, Paraphrasing, and Summarizing
	Writing for a variety of purposes including reflection
	Investigating the cultural, geographic, and physical features of an area
	Communicating ideas through discussion
Internet domain:	Research
	Virtual field trip
	Interpersonal Exchange
Technology connections:	Internet Navigation
	Web Searching
Materials Required:	Text and Web resources about Alaska

The goal for this activity is to provide the students with a very brief opportunity to learn a little about Alaska. The goal for this investigation is that they have some context for understanding how the cultural, physical, and geographic characteristics of the region, as well as weather patterns, play a part in the race. The study of Alaska can easily be extended if it meets state or district content standards.

There are several ways to involve the students in a brief investigation of Alaska.

Students can conduct a web search to locate resources.

Students can work in small groups to investigate specific topics which they then share with the group.

Students can take a virtual tour of Alaska through one of the many tourist information Web sites.

Students can communicate with students in Alaska and find out what their lives are really like.

Parents and community resources can be invited in to share insights about the region.

Activity 7: Constructing a Mural Sized Trail Map.

Content connections.	Analysis and synthesis of data
	Representation and presentation of data
	Application of measurement skills to real world
	Map skills
	Vocabulary development
Internet domain:	Research
Technology connections:	Internet Site Navigation
	Downloading audio-files
Materials Required:	Bulletin board paper
	Overhead Projector
	Map of Alaska

The mural sized map will be an integral part of the investigation as the race progresses. Constructing it is an opportunity to develop, practice, and refine map skills. This can be a job for a small group of students or can be something to which the whole group contributes.

The easiest way to create the outline for the map is to place a small map of Alaska on the overhead projector, magnify it directly onto a bulletin board and trace around the projected image. Make sure to magnify and reproduce the map scale. The students can then put in the physical features, i.e. the mountain ranges, rivers, and oceans that they uncovered in their research. The next step is to identify the trail and label the checkpoints. Students can approximate the distances using the map scale and the information about the distances between checkpoints found on the Web site.

The checkpoint names, such as Shaktoolik and Unalakleet, will look and sound unfamiliar to the students. They can go to the Iditarod Supersite Web site and click on the links to hear the names pronounced correctly.

Activity 8. <u>The Iditarod Rules and The Job of Mushing</u>

Content connections.   Reading for a variety of purposes
Analysis and synthesis of data
Writing as an aid to personal reflection
Vocabulary development
Internet domain: Research
Information Analysis
Technology connections: Internet Site Navigation
Materials Required: www.iditarod.com
Text and Web resources

Learning about the Iditarod rules will help the students understand the race better but it also helps to shape their understanding that having an adventure doesn't necessarily mean doing something without limitations or boundaries.

Students can learn about the rules through the web site or in discussion. They can lead to some interesting journal questions and reflections such as . . .

How do the rules keep the race fair?
Why do you think the rules limit the equipment that the Musher can take?
Why do you think the rules tell the Musher how much food to carry for the dogs?
Is the Iditarod still an adventure if there are rules?

Learning about the job of Mushing also gives context to the investigation. It illustrates that being adventurous isn't always about being spontaneous. These adventurers train very hard in order to take part.

The students can read about how the Mushers and dogs train and prepare for the race, the commands that make the dogs work, the various dog positions on the team, and how the animals are cared for. There are many links to this

information on the web site and in the classroom library of Iditarod related books

and articles

The students can create a simulated dog team. They can line up in the

positions of the dogs on the team. One student can role-play the musher and call

out the commands, e.g. Gee – for turn right; Haw – for turn left.

Activity 9. <u>The Start of The Race</u>

Content connections.   Reading a variety of material for information
Internet domain: Virtual field trip
Technology connections: Internet Site Navigation
                          Real-time Internet broadcast
Materials Required: www.iditarod.com
                          Newspaper and Web resources

Since the race officially starts on a Saturday and then restarts on Sunday,

students cannot watch the live Internet broadcasts of both starts at school. If they

have the technology to do this at home, they should be encouraged to do so.

Otherwise these live transmissions should be downloaded for later viewing.

(Warning: this is memory intensive). By now the students' families are probably

as excited by the event as they are. Students should look out for television and

newspaper reports about the start of the Iditarod and record their impressions in

their journals.

The start of the race provides an opportunity for discussion.
Why are there two starts?
What is the purpose of the start in Anchorage?
Does it add to, or take away from the adventure to have so much
media attention?
Has the Iditarod become too commercial?

These last two questions would make great questions for a Musher interview.

Activity 10. <u>Downloading Daily Race Standings</u>

Content connections.   Interpretation, analysis and synthesis of data
                                       Working with statistical data
                                       Application of computation skills
Internet domain: Information Analysis
Technology connections: Internet Site Navigation
                                       Downloading of resources
Materials Required: www.iditarod.com
                                         Student recording sheet

Several times a day the race standings are updated on the Iditarod Web site. Twice a day, once as they arrive at school and once in the early afternoon, the students should download the current standings and update their Musher tracking sheets (following) for each of their mushers. This sheet asks them to record the following.

> Date
> Time of last race update
> Current race position of musher
> Last checkpoint visited
> Number of dogs running

The students can use this information to calculate . . .

> How many miles total the musher has traveled
> How many hours/days the musher has traveled
> How many hours rest the musher has taken

Depending on their level of experience, students can also calculate

> The distance traveled relative to the entire race – i.e. half way, etc.
> The average speed traveled
> The average number of miles traveled per day

The race standings will also indicate how many mushers have scratched (withdrawn). Students can therefore calculate how many mushers are still racing each day.

Musher Tracking Sheet

Name _____

Musher Name _____   Race Number _____

Date	Time	Race Position	Last Checkpoint Visited	# of Dogs Running

Activity 11. <u>Following the Leader and Learning About the Checkpoints</u>

Content connections.   Reading different materials for a variety of purposes
                                    Interpretation, analysis and synthesis of data
                                    Use of communication strategies
                                    Investigation of cultural features of region
                                    Investigation of geographic, and physical features
Internet domain: Information Analysis
                                      Interpersonal communication
                                      Virtual field trip
Technology connections: Web browsing
                                      Internet Site Navigation
                                    Downloading of resources
                                    E-mailing
                                    Web-posting
Materials Required: WWW.iditarod.com and related links

     As each checkpoint is reached, the name of the leading musher who got to it first can be written in the appropriate place on the mural map, together with the time and date of their arrival. It would also be fun to paste their picture next to the checkpoint name. Musher pictures are available for download on the Iditarod site.

     Through the links on the Iditarod site the students can take a virtual tour of the village (or in some cases its just a hut) at each checkpoint and learn more about the people who live there and the volunteers who run it. At some of the checkpoints there are real time links and the volunteers will answer E-mail questions and report on what the mushers are doing as they pass through. This is the perfect opportunity to communicate with students who live, and go to school along the trail. Connect to them by posting a request on Kidlink.

     The students can record in their journals what they learn about each checkpoint.

Activity 12. <u>Reading Zuma's reports and E-mail</u>

Content connections.   Reading different materials for a variety of purposes
                            Communicating using the writing process
                            Writing for personal reflection
Internet domain: Research
                            Interpersonal exchange
Technology connections: Internet Site Navigation
                            E-mailing
Materials Required: www.iditarod.com

Zuma the Husky writes at least one report each day from trail headquarters, where she monitors the race and eats pizza sent to her by her students fans. Reading the day's Zuma report is a nice way to begin each activity during the race. It sets the scene. Each day the students can respond to the issues raised by Zuma's report in their journals.

By now many of the students may have e-mailed Zuma and should have received responses. These can be incorporated into classroom discussions and journaling. Remember, when students decide to E-mail Zuma (or any mushers or checkpoint volunteers) they must take their letter through the entire writing process before sending, just as they would a letter sent by 'snail' mail.

Activity 13. <u>The Red Lantern</u>

Content connections.   Communication of ideas through discussion
                            Writing for personal reflection
Internet domain: Research
Technology connections: Internet Site Navigation
Materials Required: www.iditarod.com
                            Red Flag

As well as following the leaders it is appropriate to follow the last racer. The premise of the Iditarod is that it is an incredible achievement to take part, let

alone finish. The adventurers are celebrated no matter what their final race position. With that in mind the race awards the "Red Lantern" to the last musher crossing the finish line.

Make a red flag on a push-pin that can be moved along the mural trail map as the red lantern position progresses along the trail. Each time a different musher takes the red lantern position, attach their picture to the flag.

Students can research the significance of the red lantern.

Discussion and journal reflection questions might include . . .

How do you think the mushers feel about receiving the red lantern?
Why should the mushers who don't win, or even finish, feel proud of their achievements?

Activity 14. <u>Tales from the Trail</u>

Content connections.	Reading different materials for a variety for purposes
	Reading response and comprehension
Internet domain:	Interpersonal exchange
	Publishing
Technology connections:	E-mailing
	Web-posting
Materials Required:	www.iditarod.com
	A variety of fiction and non-fiction texts

Many wonderful books about the Iditarod may be above student's independent reading level. Each day at Read-Aloud time take the opportunity to read some of the true stories from the Iditarod.

Books perfect for read-aloud time include:

<u>Susan Butcher and the Iditarod Trail</u> A biography of the most famous Iditarod champion which also includes a nicely written history of the Iditarod.
<u>Iditarod Classics</u> A collection of stories from a variety of Mushers. Watch out – some of their language is "expressive".

Winterdance Gary Paulsen's (a favorite children's author) own account of his running of the Iditarod.
Iditarod Dreams An autobiography by Deedee Jonrowe detailing her life as a musher.

Listening to these stories gives students another window into the lives and motivations of these amazing adventurers. Students can respond to the stories in their journals and may generate questions to ask their favorite musher.

This project focuses on reading and interpreting expository, non-fction texts, web sites and biographies. However the opportunity to incorporate quality, related fictional literature is too valuable to ignore.

Example texts are:

For beginning readers –

Balto the Bravest Dog Ever
Students can compare this version of the history of the Iditarod with the true story found on the Iditarod site and in many of the classroom resources.

For more experienced readers –

Silver
Students can relate to the adventures of someone their own age in the same environment as the Iditarod.

For accomplished readers –

Stone Fox
How are the Iditarod and this dog sled race similar/different. What is the difference in the motivation between an Iditarod musher and Willy? How do the different motivations shape their experience?

Dog Song
What special insights does this book give into the life of an Alaskan native and Musher.

<u>Black Star, Bright Dawn</u>
What insights does this book give into the dangers of the Iditarod.
What aspects of it are unbelievable?

A complete reference list of texts is found on page 95.

Students can use Kidlink to engage in literature discussion groups with

other students around the country who are studying the Iditarod. They can also

generate a Web-site of book reviews and recommendations for others to enjoy.

Activity 15. <u>Investigating the Logistics of the Race.</u>

Content connections.   Reading different materials for a variety for purposes
                         Apply computation to real world problems
Internet domain: Research
                         Information analysis
Technology connections: Web-site navigation
Materials Required: www. Iditarod.com and links

This is a broad topic and can be approached in several different ways.

The underlying message is that adventures of this kind take a great deal of

planning, preparation, support people and MONEY! Questions can be developed

according to the mathematical ability of the students and their understanding of

the concepts. Example questions:

From your reading and research you will have learned that, for each dog
on their team, a musher must ship at least 5 pounds of dog food to each of 14
checkpoints, and 2 pounds of dog food to each of two checkpoints. Calculate
how much dog food will be needed for each of your teams for the entire race.

Mushers sometimes carry 100 booties per dog. How many booties will
your mushers need to carry for their teams? Booties cost $375 for 500. How
much will the booties cost the musher in total?

Mushing is an expensive sport! Using the list of musher equipment and the price list provided in the information packet. Calculate your team's expenses for the Iditarod.

Research the support people who are helping your teams compete. Who are their sponsors? How are they raising the money to participate in the race?

How do the mushers navigate their way along the trail? Research the various methods they use.

Activity 16. Investigating Body Tolerances

Content connections.	Reading different materials for a variety for purposes
	Exploring scientific principles
	Experimental design
Internet domain:	Research
	Interpersonal exchange
Technology connections:	E-mailing
	Web-posting
Materials Required:	Individual

This is a also broad topic and can be approached in several different ways according to the ability level of the group and content area learnings you wish to incorporate.

The Iditarod puts people (and dogs) into extreme situations for which their body was not designed. Adventurers are often putting themselves in harm's way, but just how much can the human body stand?

Example questions include....

What happens to your body when you are exposed to the cold?
What experiment can you do to demonstrate this?
What can happen to the body in extreme cold such as the temperatures out on the Iditarod trail?
How do the mushers try to prevent this?
Gary Paulsen talked about hallucinations he experienced because of lack of sleep. Why might this be dangerous?
Why do the Mushers keep going without sleep?
How long can the human body go without sleep? Why is sleep important?

Students can collaborate with their classmates to answer these kinds of questions. They can also post questions through Kidlink so that other students may join in the discussion. However, this activity provides the perfect opportunity to set up some kind of web-mentoring. Approach an expert in the field, such as a doctor or scientist (local Universities are excellent sources), and ask if they are willing to respond to student questions. This must obviously be arranged in advance. If possible invite the expert to participate in a live chat forum that can be run through kidlink. This allows for a dynamic interchange to take place.

Activity 17. Interview A Musher

Content connections.	Writing as communication
	Composing through the writing process
	Questioning
Internet domain:	Interpersonal exchange
Technology connections:	E-mailing
Materials Required:	None

As Mushers complete the race or are scratched they are sometimes willing to respond to brief E-mails. Students should carefully develop one or two key questions that they would like to ask. The opportunity to make direct and personal contact with the musher that they have followed is a powerful experience and allows the student to feel even more connected to the events.

The students must take their proposed E-mail through the entire writing process before sending. Ensuring that their E-mail is free of spelling errors and grammatical mistakes is a way of demonstrating respect and appreciation for the mushers who will read them.

Some students may need a framework to help them compose such a letter. Guidelines for E-mails might look like this...

Musher E-Mails

Include...

A sentence congratulating the musher on his/her performance.

A sentence telling them who you are.

A sentence telling why you enjoyed rooting for them.

A sentence that shows that you really were following what happened to them. i.e. a reference to an incident on the trail.

A sentence beginning "I would like to ask you..."

The question "Why did you want to run the Iditarod?"

1 other question that you don't already know the answer to.

If and when the students receive a reply it will probably become a most treasured possession.

Activity 18. Discussing Ethical Dilemmas.

Content connections.	Communicate ideas through discussion
	Writing for personal reflection
	Working with statistical data
Internet domain:	Interpersonal exchange
Technology connections:	Web-posting
Materials Required:	None

During the course of the race dogs occasionally die, Moose and other wildlife interfere with the trail and have to be shot, and mushers can get seriously injured or ill. Any and all of these events will cause the students distress and perhaps confusion; but they provide a valuable learning opportunity to discuss the ethical dilemmas involved in many adventure expeditions. The students can define the term Ethical Dilemmas in the context of the examples that are raised. These issues can be discussed with other classes through Kidlink. Students can post requests for feedback about these dilemmas and gather data regarding the trends in opinion around the country.

The students will probably be most upset at the death of a dog. Some frequent questions that arise during discussions and journaling include:

Is it fair to make the dogs participate in the Iditarod if they might die?
Is the Iditarod inhumane?
How can we prove that the dogs like to race?
How do the rules try to keep everyone, including animals, safe?
What decisions do mushers make that make the race safe or dangerous?
Should the musher be held responsible for the death of the dog?
Is it right to kill a Moose even if it's threatening the team?
Shouldn't people stay out of the way of the wildlife habitats?
Is it fair for mushers to risk their lives and worry about their families?
Is it right to risk the lives of the volunteers who might go out to rescue mushers in trouble?

There are no right or wrong answers to these questions and the students should be encouraged to make individual decisions but to respect others points of view. Their journal entries will reflect the depth of their thought in this area.

Activity 19. <u>The race is Over, So What Did you learn?</u>

Content connections.	Assessment
	Application of new knowledge and skills
	Represent ideas Creatively
Internet domain:	Publishing
Technology connections:	Multimedia
Materials Required:	Various

The students will be given the opportunity to synthesize all that they have learned about the Iditarod in a presentation. Their work can be used to assess their learning during this phase of the unit. Ideally the projects should be collaborative in nature. Students can work in small groups with their classmates, or may even engage in an on-line project with other students. The students should decide on their own means of presenting their learning; some ideas might include.

A more detailed Musher biography which would include an E-mail interview.

A multimedia presentation about the race using Hyperstudio or Powerpoint.

A creative story about a musher/dog running in the Iditarod incorporating factual information.

A newspaper article about the events of the race and the final results.

A report on the different checkpoints along the trail.

A report on how mushers train their dogs and prepare for the race.

A collection of artwork and impressions of the Iditarod.

A report on the history of the Iditarod.

A literature review of good books about the Iditarod.

An expense report detailing the costs of running in the Iditarod for a musher.

A report written by a dog friend of Zuma or one of the team dogs.

A design for a new and improved sled.

The finished projects should be shared with class members and posted on the web.

Assessment rubrics will vary according to the individual projects chosen. What follows is a very general rubric which can be used for many of the projects, but will need to be enhanced according to individual needs.

	Accomplished	Emerging	Beginner
Project incorporates accurate facts about the race			
Project presents ideas in a creative way			
Project demonstrates appreciation for the cultural significance of the Iditarod			
A variety of resources are used to complete the project			
Project reflects synthesis of information			
Project includes as much detail as is necessary to tell the story			

Phase II: Discovering Adventurers Past and Present

Content connections.	Reading a variety of materials for differing purposes
	Composing using the writing process
	Communication skills
	Application of new knowledge and skills
	Individual skills depending on project chosen
Internet domain:	Research
	Information analysis
Technology connections:	Multimedia
Materials Required:	Various

In this phase the students will apply what they learned about the Iditarod into an investigation of an Adventure Expedition of their choice. Students will model the learning strategies exposed by their study of the Iditarod, to research, synthesize and present information on their chosen topics. Students will work collaboratively with small groups of their classmates.

This phase involves the students in gathering information about another adventure expedition and preparing a presentation on what they discover. The idea is that the work on the Iditarod will have given them a frame of reference with which to understand other adventure activities and important moments in history.

Possible topics for their research include:

Adventure Expeditions in History
The travels of Marco Polo
The voyage of Christopher Columbus
The voyage of James Cook
The expedition of Henry Stanley
The adventures of David Livingston
The first successful summit of Everest
The early missions into space
The race to the North and South Poles

The journey of Lewis and Clark
The voyages of Magellan
The search for the Northwest Passage
Amundsen's navigation of the Northwest passage
The flight of Charles Lindbergh
The flight of Amelia Earhart
The flight of the Wright Brothers

Adventure Expeditions of the recent past and present
The Expeditions of Helen and Bill Thayer
Robert Ballard's search for the Titanic
Maya Quest
EcoChallenge
Branson's Balloon attempt
Paul Pfizzer's climb of Everest
Jon Krakauers Everest Summit
John Glenn returns to space
Attempt to climb Rainier by a paraplegic
Circumnavigation in of the oceans in a Pedal Boat
Andrew Mercer's Amazon adventure
Transatlantic rowing expedition
The Whitbread round the world yacht race

Guidelines for the activity include:

- Students must collect information from at least three sources, including the Internet.

- Students may choose any medium to present their learning, but they must choose a different medium from one that they chose to present their Iditarod project.

Assessment rubrics will be dependent on the individual adventure chosen and the medium selected to present it. However, the following general guidelines work well for multimedia presentations.

Your adventure report must contain the following information . . .

- A map showing the route or location of the adventure

- A description and time line of the adventure

- A picture of the adventurers/adventure downloaded from the web or photocopied.

- A creative picture of the adventurer or adventure from the researcher's imagination and experience.

- The motives that led to the adventure being undertaken

- The method that was used for navigation (if appropriate)

- A description of the support people who made the trip possible

- Logistic difficulties of the adventure

    What supplies did they need?

    How did they carry their supplies?

    How did they raise the money for the trip?

    Environmental conditions that made the trip easy/difficult

    Stresses to the adventure

- Ethical Dilemmas raised by the adventure

- Reasons for the success or failure of the adventure

All of these topics have been explored and defined in terms of the Iditarod. Students are encouraged, with guidance, to apply this knowledge to the new adventure.

The students may notice differences in the factors motivating adventures in history compared with the factors motivating today's adventurers. Adventurers of the past were also often Explorers. Can today's adventurers also be described as explorers?

Key texts will be instrumental in helping the students complete the assignment.

They include:

<u>The Explorer's Handbook</u>
<u>Talking with Adventurers</u>
<u>Crocodiles, Camels and Dugout Canoes – Eight Adventurous Episodes</u>

The students will share their learning with their classmates and can post their work on the web.

By the end of the activity the students will have in depth knowledge of two adventure episodes (the Iditarod and their chosen topic) plus cursory knowledge of up to 24 adventures researched by other students.

Phase III: A Virtual Adventure

Content connections.   Various
Internet domain: Research
                            Interpersonal exchange
                            Virtual field trip
                            Collaborative problem solving
Technology connections: Web searching
                            Site navigation
                            Multimedia
Materials Required: Various

Now the students are ready to go off on their own adventure. This will take the form of a simulation through one of many possible Internet sites. The students will apply the concepts and learning strategies from the previous phases of the project in creating their own adventure. The students will work in small collaborative groups to research, plan, undertake, record, and report on their trip.

Students can pick from a number of options for creating their simulated adventure. These include . . .

A journey exploring the volcanoes around the ring of fire
      Starting place: www.usgs.org

An exploration of ancient Egypt
      Starting place: www.members.aol.com/egyptmouse

A journey through East Africa
      Starting place: www.ccph.com

An exploration of the Amazon rain forest
      Starting place: www.ccph.com

Retrace Magellan's route around the world
      Starting place: adventureonline.com/index.html

Arctic challenge
      Starting place: adventureonline.com/index.html

Exploring Central America
      Starting Place: adventureonline.com/index.html

When the students have selected their destination they can begin their adventure. The simulated adventure can last as long as a week or as little as one hour. The longer the simulation, the more in depth the learning. Students whose simulations last more than one day can rotate through the Internet stations once or twice a day for 20-30 minute sessions.

Before departing on their adventure the students must research their destination and fulfill the requirements listed in the following task card.

Before you depart, you will need to . . .

Generate a list of supplies you will need on your trip.

Plan for the weather and other environmental conditions.

Estimate the cost of your trip, based on travel expenses and supplies.

Describe any preparation or training you need. For example, do you need to get vaccinations?

Make a list of the support people who will help you on your trip and describe the jobs they will do.

Plan your travel dates and times.

During the Adventure students will need to record their trip and document their learning.

During your trip you will need to . . .

Keep a log of your experiences. What did you see, who did you meet, how did you feel, what did you learn?

Make a map to show where you went

Take (download) pictures of what you see.

After the adventure the students must incorporate all of the above into a presentation about their adventure. This can take the form of a multimedia presentation, book, or poster.

Assessment will be dependent upon the individual projects chosen.

Culminating Activity

To celebrate the end of the investigation the parents and other classes will be invited to an "Adventure Conference." The students in their roles as adventurers will be the key-note speakers. Each group will be encouraged to talk about their adventures and field questions from the audience. The students could perhaps dress in clothing appropriate to their adventure.

If possible the Adventure Conference should be broadcast on the Internet using Kidlink so that other classes can share in the experience.

Resources

Internet Resources

Kidlink   www.kidlink.org

Official Iditarod Site   www.iditarod.com

Iditarod Supersite   www.dogsled.com

Musher Mike's Diary   www.alaska.net/~mushmike/mushlink.html

    Follow the links from the above sites to other Iditarod Web pages.

Travel with Mousey   www.members.aol.com/egyptmouse

Let's Go Around the World   www.ccph.com

Adventures on line   adventureonline.com/index.html

    Follow the links from the above sites to other virtual field trips.

Audio-Visual Resources

Iditarod – A video available from the Iditarod Trail Committee

    Order on-line at www.iditarod.com

Text Resources

Bacon, E. To See the Moon

Blake, R. Akiak

Brindell-Fradin, D. Alaska

Brown, T. Iditarod Country

Dolan, E. Susan Butcher and the Iditarod Trail

Freedman, L. Iditarod Classics

Freedman, L. Iditarod Silver

Gill, S. Kiana's Iditarod

Harter, L. <u>Where's the Boss?</u>

Jackson, J. <u>Elim the Determined Athlete</u>

Jonrowe, D. <u>Iditarod Dreams</u>

O'Dell, S. <u>Black Star Bright Dawn</u>

Osinski, A. Osinski, <u>The Eskimo: Inuit and Yupik People</u>

Paulsen, G. <u>Dogsong</u>

Paulsen, G. <u>Winterdance</u>

Paulsen, G. <u>Woodsong</u>

Schultz, J. <u>Iditarod: The Last Great Race</u>

Seibert, P. <u>Mush</u>

Smiler-Levinson, N. <u>If You Lived in the Alaska Territory</u>

Standiford, N. <u>The True Story of Balto</u>

Reynolds-Gardiner, J. <u>Stone Fox</u>

Riddles, L. <u>Storm Run</u>

Van Steenwyk, E. <u>Three Dog Winter</u>

Whelan, G. <u>Silver</u>

White, E., & Freedman, D. <u>Foxy's Tale</u>

Yanuchi, L. <u>Running With the Big Dogs</u>

Chapter V

Summary, Conclusions and Recommendations

Research has documented that the majority of student Internet use is restricted to passive learning experiences. Students typically download research information and use it just as they would texts and more traditional media. One reason for this kind of Internet use is that teachers have not been trained in how to use the technology effectively. A second reason is that there is no standard definition of what constitutes appropriate Internet use.

The Internet has the power to serve students and enhance their learning in much more powerful ways than it is currently doing. When used as an active learning tool the Internet has the power to connect children with people and ideas that would normally be beyond their experience. Six domains of Internet use allow for active use of the technology; they are, research, interpersonal exchange, information analysis, publishing, virtual field trips, and collaborative problem solving. Each of these activities has specific characteristics allowing the student to learn in ways not possible with any other medium. The active learning model suggests that teachers should construct new curricula around these specific features of the Internet rather than using it in service of traditional pedagogy. Whenever possible, students should design their own projects and be self-directed in their learning. Constructivist philosophies are considered highly consistent with best practices in Internet application.

Active learning Internet applications can be said to share seven characteristics; such Internet experiences are constructive, authentic, collaborative, integrated, employ multiple resources, foster commitment, and are content driven. These characteristics should be used as criteria in developing high quality Internet projects. When these criteria are applied, the Internet curriculum can be more responsive to differing learner abilities and interests, can provide authentic opportunities for application of skills, and can ensure an interactive experience.

When active learning with the Internet becomes part of the elementary experience, many benefits in student learning are noted. The greatest benefit is rooted in increased motivation. This translates into greater student engagement and on-task behavior, and therefore also into increased learning. Higher-order thinking skills are enhanced as students work on solving authentic, multifaceted problems. Communication skills are deepened as students collaborate with classmates as well as with individuals far removed in time and space. Content driven Internet projects serve as a vehicle to develop, practice, and refine important content area concepts and skills in an authentic context.

As teachers begin to design appropriate Internet based activities they must address a variety of issues concerning safety, management, assessment, and alignment of content learning objectives. These issues can best be addressed by implementing an existing curriculum, such as the one presented in chapter four. This will help sensitize them to the benefits, as well as the possible

pitfalls, associated with Internet use and will better prepare them to design their own projects.

It is this author's position that the Internet has the power to change the nature of curriculum more profoundly than any other learning technology that has come before. If the Internet is to live up to its full potential as a learning tool teachers must become more knowledgeable of the technology. Training teachers in ways to harness the learning potentials of the Internet, and to develop curriculum using an active learning model, must become the priority of teacher preparation programs and school districts. In addition, the author recommends more research comparing the kinds of learning that occurs when students work with the Internet. This will serve to sharpen our definition of best practice and will help to convince teachers of the value of the medium.

It is hoped that this document will encourage teachers to begin using Internet technology in their classrooms. The author wishes them luck, and looks forward to meeting them on-line.

Bibliography

Anderson, R. E., & Ronnkvist, A. (1999). The presence of computers in american schools. Irvine, CA: Center for Research on Information Technology and Organization. (ERIC Document Reproduction Service No. ED 430 548)

Becker, H.J. (1999). Internet use by teachers: Conditions of professional use and teacher-directed student use. Irvine, CA: Center for Research on Information Technology and Organizations. (ERIC Document Reproduction Service No. ED 429 564)

Bellan, J. M., & Scheurman, G. (1998). Actual and virtual reality: Making the most of field trips. Social Education, 62 (1), 35-40.

Berenfeld, D. (1996). Linking students to the infosphere. In T. King (Ed.), Technology in the classroom: A collection of articles (pp. 15-30). Arlington, IL: Skylight.

Bryant, R. B. (1998). Changes in learning: An investigation of the benefits to learning with the internet. Journal of the American Society for Information Science, 49 (9) 35-66.

Cotton, E. G. (1998). The online classroom: Teaching with the Internet (3rd ed.). Bloomington, IL: EDINFO Press.

Doherty, A. (1998). The internet: destined to become a passive surfing technology? Educational Technology, 38 (5), 61-63.

El-Hindi, A. E., (1998). Beyond classroom boundaries: Constructivist teaching with the internet. Reading Teacher, 51, 694-700.

Greening, T. (1998). Building the constructivist toolbox: An exploration of cognitive technologies. Educational Technology, 38 (2), 23-35.

Harris, J. (1998). Design tools for the Internet-supported classroom. Alexandria, VA: Association for Supervision and Curriculum Development.

Haury, D. L., & Milbourne, L. A. (1999). Using the internet to enrich science and learning. Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education. (ERIC Document Reproduction Service No. ED 433 218)

Hubbard, R. (1998). Increasing internet usage among teachers and students for information retrieval and curricular augmentation through ongoing training and support. Southeastern University. (ERIC Document Reproduction Service No. ED429 557)

Humes, B. (1999). Understanding Information Literacy. Washington DC: National Institute on Postsecondary Education, Libraries, and Lifelong Learning. (ERIC Document Reproduction Service No. ED 430 577)

International Society for Technology in Education, (1996). National educational standards for students. Eugene, Oregon: NSTE.

Johnson, D. G. (1998). Effectively integrating the world wide web and computer software technology into diverse classrooms. (ERIC Document Reproduction Service No. ED 429808)

Kaufman, R. (1998). The Internet as the Ultimate Technology and Panacea. Educational Technology, 38 (1), 63-64.

Kozma, R., & Shank, P. (1998). Connecting with the 21st century: Technology in support of education reform. In C. Dede (Ed.), <u>Learning with technology</u> (pp. 5-27). Alexandria, VA: Association for Supervision and Curriculum Development.

McDonald, J., Garties, P., Hanson, M., Slygh, G., & Shroeder, J. (1996). Internet use in the classroom: In search of constructivist practice. <u>Journal of Visual Literacy, 61,</u> 91-108.

Moran, L. H. (1997). Technology in education vs. technology education. <u>Tech Directions, 3</u> (12), 11-16.

Morden, D. L. (1996). Crossroads to the world. In C. Dede (Ed.), <u>Learning with technology</u> (pp. 5-27). Alexandria, VA: Association for Supervision and Curriculum Development.

Norris, J. (1998). <u>Activities using the world wide web.</u> Monterey, CA: Evan-Moore.

Oliver, B. E., Malm, L, D., Malone, B. G., Nay, F. D., Saunders, N. G., & Thompson, J. C. (1997). <u>Enhancing curricula through internet technology.</u> Chicago, IL: Mid-Western Educational Research Association. (ERIC Document Reproduction Service No. ED 413 862)

Parker-Roerden, L. (1997). <u>Net lessons: Web-based projects for your classroom.</u> Sebastopol, CA: Songline.

Reum, D. (1998). <u>Social studies activities using the world wide web.</u> Monterey, CA: Evan-Moore.

Reynolds, E., & Plucker, J. (1999). Panning for gold (creatively) on the new frontier: Locating and evaluating educational resources on the internet. NASSP Bulletin, 83 (607), 8-15.

Rice, M. L,, & Wilson, E. K. (1999). How technology aide constructivism in the social studies. The Social Studies, 90, 28-33.

Roblyer, M. D. (2000). The national educational technology standards: A review of definitions, implications, and strategies for integrating NETS into K-12 curriculum. International Journal of Instructional Media, 27, 133-146.

Sherry, L. (1997). Linking technology with promising practices to improve teaching and learning. (Eric Document Reproduction Service No. (ED 414 277).

Sunal, C. S., Smith, C., Sunal, D., & Britt, J. (1998). Using the internet to create meaningful instruction. The Social Studies, 89, 13-27.

Teicher, J. (1999). An action plan for smart internet use. Educational Leadership, 56 (5), 70-74.

Tillman, M. (1998). The internet, internet curriculum materials, and constructivist learning theory. (ERIC Document Reproduction Service No. ED 425 706)

U.S. Department of Education, (1996). Getting america's students ready for the 21st century - meeting the technology literacy challenge: A report to the nation on technology and education. (DOE publication) Washington DC: Author.

Washington Commission on Student Learning, (1996). Essential academic learning requirements. Olympia, Washington: Office of Superintendent of Public Instruction.

Willis, A. (1998). Effective practice: The view from across the nation. Social Studies Review, 38, 18-20.