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Science Education Update Conference  
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Science Education Update Conference

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### Accessibility Online: All Students means all students.

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# Accessibility

online: all students

means all students



# *Online Accessibility in Science*

*What every teacher should know*



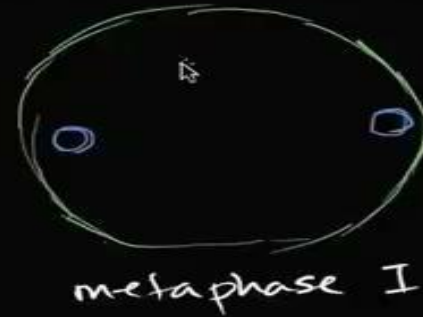
NSTA Atlanta  
2023

# Example #1

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# Example 2



# How are things going so far?

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Notice

Wonder

# Presenters

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Jennifer Bliss

Iowa Educational Services for the  
Blind and Visually Impaired

STEM Consultant

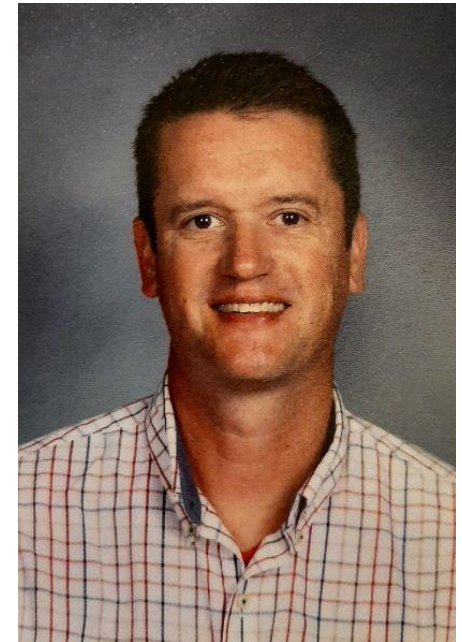
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# Talk to someone next to you

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Think of a student who might have a disability:

- What would be most troubling in a classroom?
- What accommodations might be most helpful?
- What questions do you have for us?



# We are all temporarily “abled”

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# Accessibility benefits everyone

<b><u>Ability</u></b>	<b>Permanent</b>	<b>Temporary</b>	<b>Situational</b>
<b>Seeing</b>	<b>Visually Impaired</b>	<b>Age related vision, fatigue</b>	<b>Darkness, viewing web on a phone</b>
<b>Hearing</b>	<b>Hearing Impaired</b>	<b>Ear infection</b>	<b>Loud environment, very quiet environment</b>
<b>Text Input</b>	<b>Cerebral Palsy</b>	<b>Hand injury</b>	<b>Carrying objects, eating or drinking</b>
<b>Cognition</b>	<b>Cognitive impairment</b>	<b>Sleep deprivation, illness, language learner, emotion</b>	<b>Distraction, Hurrying, age, stress</b>

# Why is this timely?

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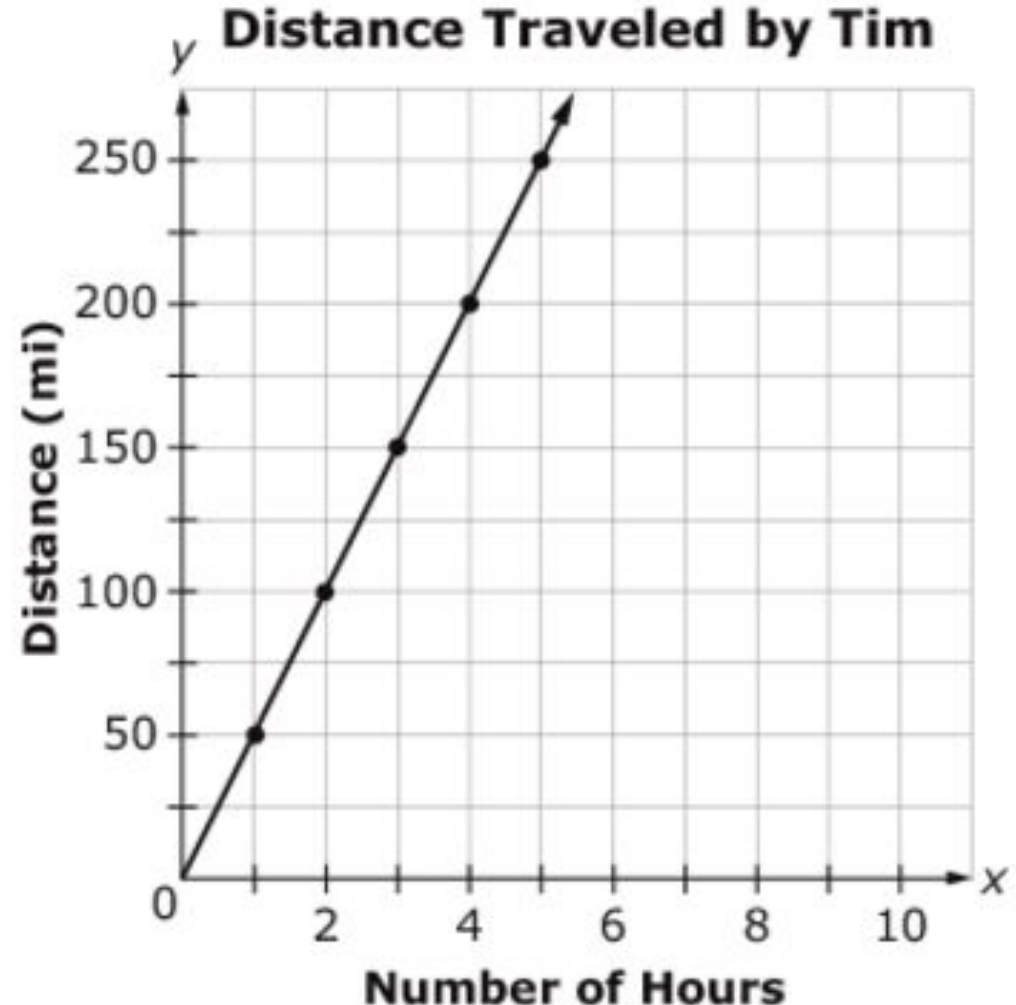
Google Classroom

Blackboard

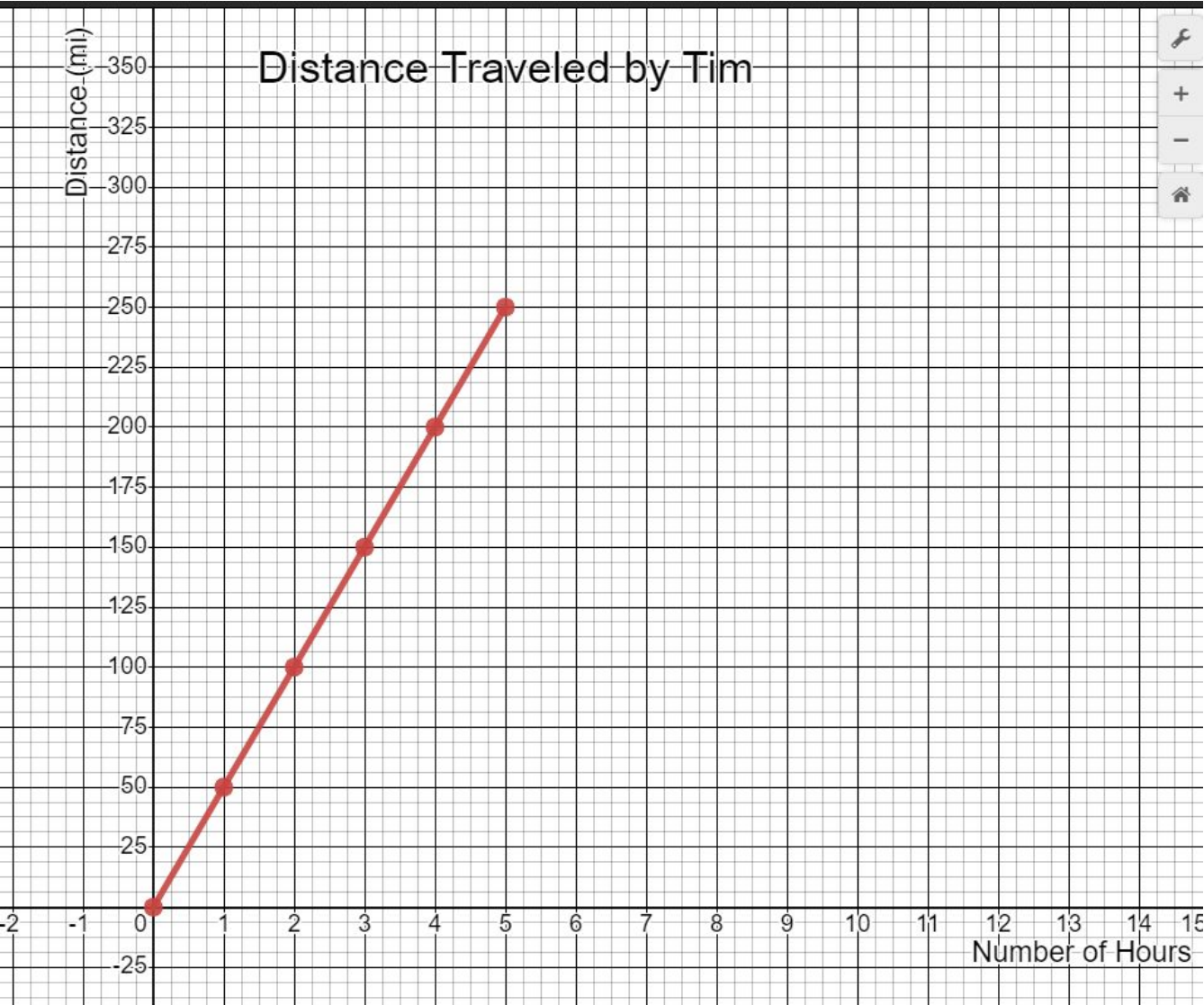
# Where does this show up in science?

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"The title of the graph is, distance traveled by Tim; The x axis is titled, number of hours; The axis has a range from 0 to 10, increasing in increments of 2; The **why** axis is titled, distance, miles; The axis has a range from 0 to **2 hundred 50**, increasing in increments of 50; A solid line with five points labeled is on the graph. The line begins at 0 comma zero, and passes through the points, 1 comma fifty, 2 comma 1 hundred, 3 comma 1 hundred fifty, 4 comma 2 hundred, and 5 comma 2 hundred fifty. The line continues."



# An accessible version using Desmos



# Accessible vs. less



## The Pollination Process

I can name the different parts of a flower and explain their role in pollination and fertilisation.

Fill in the gaps in the sentences below.

1. The flower \_\_\_\_\_'s bright colours and fragrant scents attract an insect.
2. The insect arrives on the flower to collect \_\_\_\_\_. This is a sweet liquid which makes perfect insect food.
3. As the insect is gathering the nectar it rubs against the \_\_\_\_\_ which rub \_\_\_\_\_ onto the insect.
4. When the insect gets hungry again, it gets attracted to another flower's bright \_\_\_\_\_ and fragrant \_\_\_\_\_.
5. As the insect feeds on the nectar in this new flower, the \_\_\_\_\_ stuck to the insect from the first flower rubs off onto the female parts of the second flower (the \_\_\_\_\_).
6. Part of this pollen travels down the style and then into the \_\_\_\_\_.
7. The tiny piece of pollen joins onto an \_\_\_\_\_ in the ovary. The plant has now been fertilised.
8. The ovary of the flower turns into \_\_\_\_\_ which will then be \_\_\_\_\_ so that new plants will be able to grow somewhere else.

### Word Bank

petal	stigma	nectar	pollen
anthers	fertilised	ovule	colours
seeds	dispersed	scent	ovary

## The Pollination Process

1. The flower \_\_\_\_\_'s bright colours and fragrant scents attract an insect.
2. The insect arrives on the flower to collect \_\_\_\_\_. This is a sweet liquid which makes perfect insect food.
3. As the insect is gathering the nectar it rubs against the \_\_\_\_\_ which rub \_\_\_\_\_ onto the insect.

Link to website: [Perkinspathstoliteracy](https://www.perkinspathstoliteracy.com)

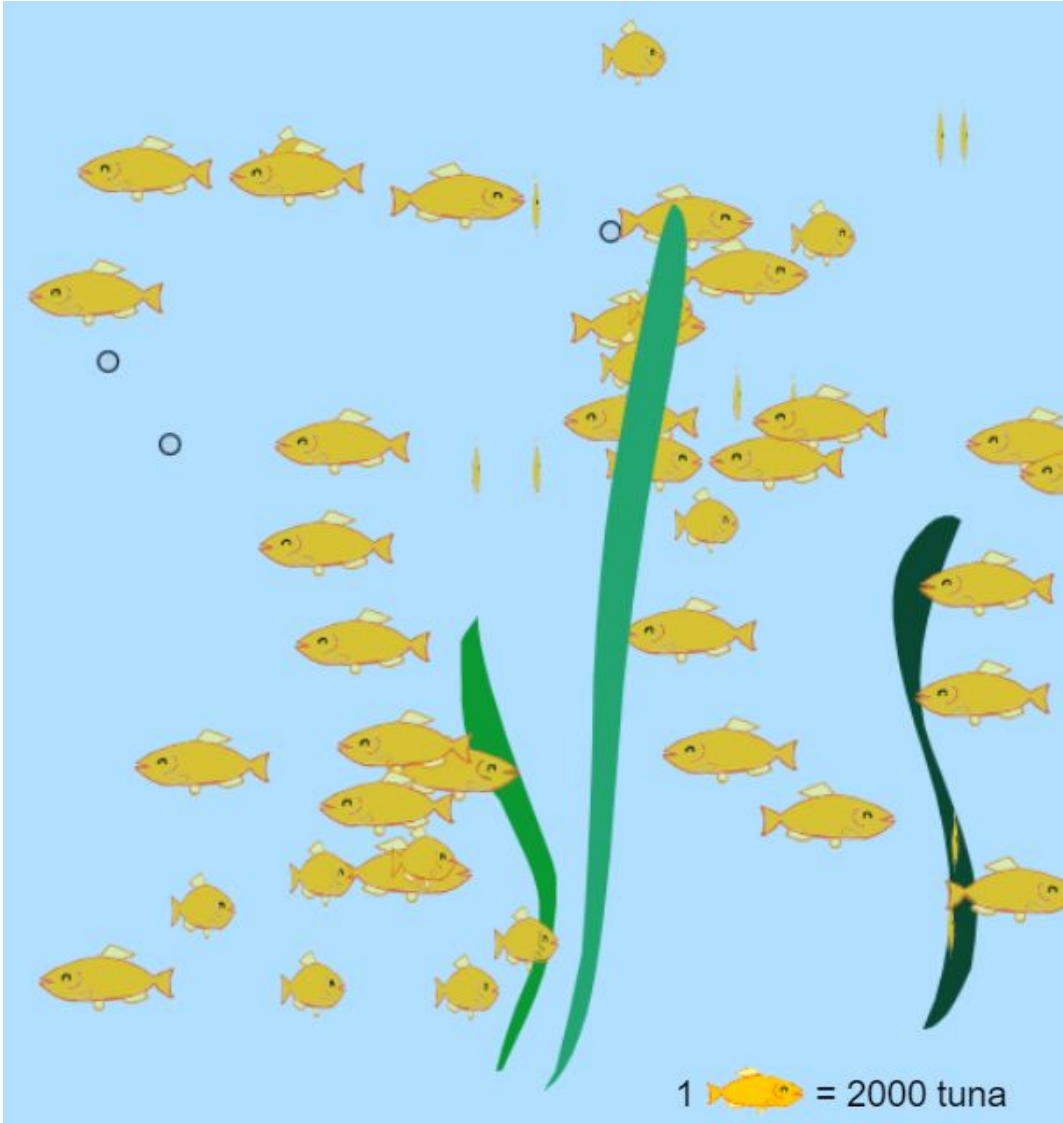
# Virtual labs—example 1

The image shows a screenshot of a web browser displaying a PhET virtual lab titled "Faraday's Law". The browser's address bar shows the URL [phet.colorado.edu/sims/html/faradays-law/latest/faradays-law\\_en.html](https://phet.colorado.edu/sims/html/faradays-law/latest/faradays-law_en.html). The lab interface features a lightbulb connected to a coil of wire, which is positioned near a bar magnet with North (N) and South (S) poles. Green arrows indicate the magnet's movement. A control panel at the bottom includes checkboxes for "Voltmeter" and "Field Lines", icons for the coil and magnet, a magnet movement control, and a PhET logo.

Faraday's Law

# Virtual Labs—example 2

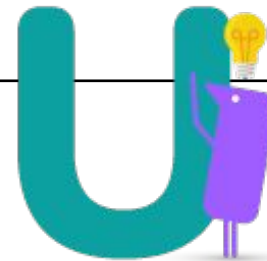
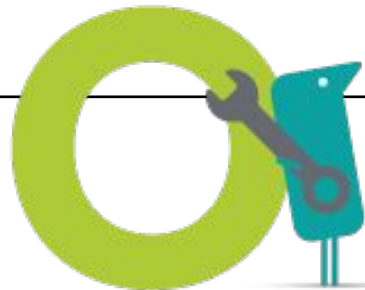
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# POUR

<b>Perceivable</b>	<b>Operational</b>	<b>Understandable</b>	<b>Robust</b>
All learners can see and hear information	All learners can navigate with preferred tools	Supports understanding through consistent and predictable design	Works with a range of current and future technologies, including assistive technologies



# Problems and solutions

Perceivable	Operational	Understandable	Robust
<ul style="list-style-type: none"><li>• Closed Captions</li><li>• Large print</li><li>• San Serif fonts</li><li>• Contrast checkers</li><li>• Transcripts</li><li>• Good color choices</li><li>• Alternative text for all images</li><li>• Well described video</li><li>• Text instead of pictures of text or numbers (PDFs are often not accessible)</li><li>• Described video</li></ul>	<ul style="list-style-type: none"><li>• Clear and consistent layouts-Consistent layouts are predictive and save time</li><li>• Structure with headings</li><li>• Use built in layouts</li><li>• “No mouse” check (keyboard operation)</li><li>• Avoid content that flashes</li><li>• Provide sufficient time</li><li>• Create descriptive links</li></ul>	<ul style="list-style-type: none"><li>• Aim for simplicity and clarity</li><li>• Provide clear directions</li><li>• Limit artistic additions</li><li>• Limit sounds and complex graphics on a page</li><li>• Clarify acronyms</li><li>• Include white space! Larger margins</li></ul>	<ul style="list-style-type: none"><li>• When asking for feedback, leave a space for answers</li><li>• Verbalize clearly when creating your own videos</li><li>• Speak words and numbers aloud</li><li>• Choose well described videos</li><li>• Collaborative programs</li><li>• Check websites for accessibility</li></ul>

# Accessibility checkers

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- [Grackle](#) (add on for slides, docs, sheets)
- [WAVE web page checker](#)
- [WCAG Color Contrast Checker](#) (plug in)
- Built in to all Microsoft applications
- [University of Wisconsin](#) has a great accessibility presence on their website

# Resources and references

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- AEM [POUR](#): Perceivable, Operable, Understandable, Robust
- Universal Design for Learning: [CAST Video](#) and [Strategies Toolkit](#)
- [Web Content Accessibility Guidelines \(WCAG\)](#)
- [Creating Accessible PowerPoints](#) from the American Printing House for the Blind
- Learn about web accessibility: [University of Wisconsin](#)
- [Described and Captioned Media Project](#)

# Thank you!

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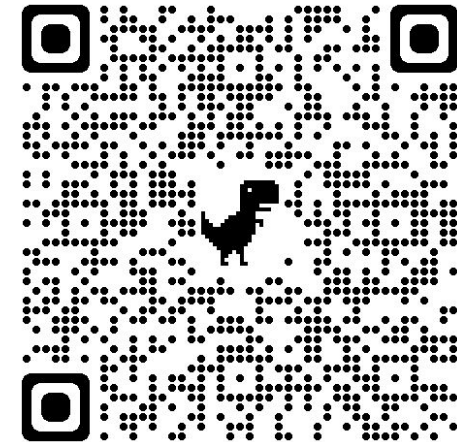


**Slides**

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**Accessibility handout**