

## *Teaching Bird Identification & Vocabulary with Twitter*

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## ABSTRACT

Species identification is essential to biology, conservation, and management. The ability to focus on specific diagnostic characteristics of a species helps improve the speed and accuracy of identification. Birds are excellent subjects for teaching species identification because, in combination with their different shapes and sizes, their plumages have distinctive colors and patterns that vary characteristically from species to species. Bird feather tracts have specific names so that proper descriptions of colors and patterns on those tracts can improve the precision and conciseness of identification criteria. We use popular social media (Twitter) to engage students in an exercise designed to familiarize them with avian species identification and improve their use and comprehension of vocabulary. This exercise can be used in higher education for ornithology and other identification courses, as well as in primary education as a basic introduction to species and biodiversity.

**Key Words:** Twitter; social media; social networking; networking sites; engagement; ornithology.

## ○ Introduction

As popular charismatic fauna that can be found nearly anywhere in the world, birds are the ideal taxonomic group for introducing students to species identification. The skin of a bird is not completely or evenly covered in feathers; feathers grow in tracts (pterylae) with featherless skin (apterylae) between them. Feather tracts vary in color and pattern according to species; in some cases, they vary by sex and age. Because birds have many feather tracts, each with their own name, the language used to describe plumage colors and patterns can be very precise. For example, the differences in the colors of feather tracts on the heads of some species, such as White-crowned Sparrows, create *eyestripes*, *superciliary lines*, *crown stripes*, and *median crown stripes*. Each of these terms refers to a different specific set of feathers on the head of the bird. In combination with

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morphological characteristics pertaining to size and shape, identification of birds can usually be achieved rather easily by descriptions of external appearance. Taking advantage of these characteristics of birds, a wide variety of high-quality, affordable field guides exists to aid in identification. Furthermore, many knowledgeable birdwatchers share information about identification criteria through community-based Internet sites.

Here, we introduce an exercise that uses Twitter, the popular social media platform, to teach students the proper use of vocabulary for external anatomical descriptions of birds. With 255 million users, Twitter is becoming increasingly prominent in education (Cano, 2012; Forgie et al., 2013; Twitter, 2014). By promoting active learning and direct interaction with instructors and colleagues, Twitter can be an effective educational tool (Tess, 2013).

This exercise gives students practice in identifying species correctly and using terminology appropriately (i.e., referring to size, shape, and the specific diagnostic characteristics that are strictly necessary for identification). Through repeated student–instructor interactions, students become active participants in the learning process. Twitter’s 140-character limit forces students to write concise descriptions focused on (1) the inclusion of traits that are diagnostic at the species level and (2) the proper use of vocabulary. The use of Twitter transforms a class assignment into an engaging and enjoyable experience.

## ○ Objectives

There are three main objectives to this exercise. First, students will learn to describe the “general impression of shape and size” (GISS) of a bird and its plumage characteristics in 140 characters or less. This will cause students to focus on the specific characteristics of each bird that are diagnostic during field identification. Second, students will practice the vocabulary associated with regions of the plumage and specific

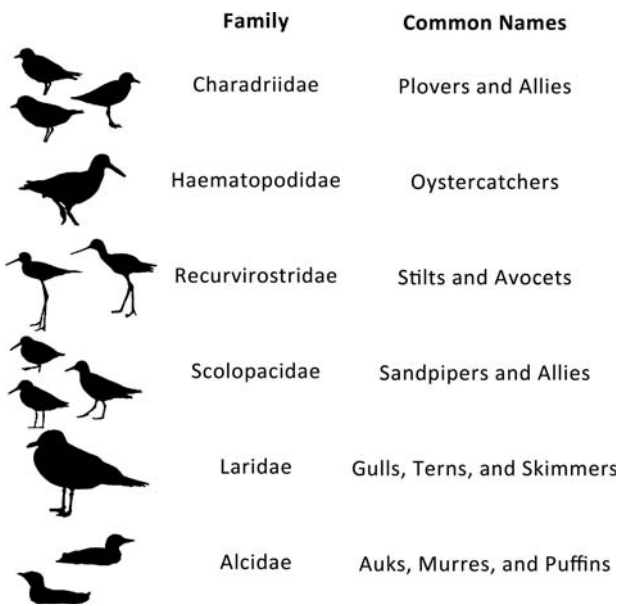
feather tracts. Finally, students will familiarize themselves with their field guides and practice identification by guessing the species described on Twitter by their colleagues.

## ○ Materials

- **Twitter.** The class must have a Twitter account. Each student must have access to the Internet on a computer or hand-held device and must create individual Twitter accounts. They must then follow the class Twitter account.
- **Field Guide.** Each student must have a field guide. Bird names and taxonomic relationships change frequently, so students should be encouraged to purchase new guides. Regional guides can be used to decrease the pool of potential species, thus decreasing difficulty.
- **Family Silhouettes (optional).** Silhouettes of families or groups of birds can be given to students to help with the concepts of shape as an important characteristic (Figure 1). Some field guides contain these images (e.g., Peterson, 2008), but many do not.

## ○ Student & Instructor Procedures

Students choose species from their local area; these can be selected from an instructor-provided list or from their field guide, after instruction on how to read geographic range maps. Students write a short description that captures key field marks necessary to identify the chosen species visually. Birds should be described as if they were seen in the field. Extraneous life-history characteristics should be avoided (Table 1). The instructor should be aware that some species may not be identifiable in descriptions of 140 characters or less. *Empidonax* flycatchers, for example, may be too similar to differentiate between in this exercise. The instructor can either mention species to avoid in the instructions for the exercise or allow the students to learn the difficulty in identification of some similar species throughout the exercise.



**Figure 1.** Examples of silhouettes within six families of the order Charadriiformes.

**Table 1. Examples of information that can be useful to include in students' descriptions of birds or that should be excluded.**

Include	Exclude
Size comparison	Clutch size
Shape information (i.e., sparrow-like, etc.)	Nest description
Overall plumage coloration	Exact size or weight
Coloration of specific topographic region of bird	Information on hybridization
Characteristic habitat	Migratory status
	Full range information

Species descriptions must be submitted in a single tweet on Twitter. The vocabulary and commands used by Twitter are simple and should be quickly mastered by the instructor (Table 2). Twitter limits the size of tweets, so the instructor need not deal with posts longer than the limit. Students tweet a description to the class Twitter account. Since other students will attempt to identify birds based on the descriptions, students should not include the common or scientific names of the birds they describe. The instructor must retweet each post to make it available to all students following the class Twitter account.

Once students have tweeted their descriptions, others guess the species that each tweet describes. To do so, students navigate to the class Twitter account. All retweeted posts will be visible on the class's Twitter page. If a description is too vague, students are encouraged to ask questions that might differentiate between alternative identifications. This feedback helps the tweeting student reformulate their description, staying within the 140-character limit. Students should continue to read the most recent tweets and attempt to identify their colleagues' chosen species.

The instructor should facilitate continued improvement in descriptions through questions. This models the types of questions students should ask. The instructor should also guide descriptions away from the common misconception that the coloration of plumage is always the best method of identification. Students should learn to focus on the GISS of the birds they are describing. Plumage coloration may be important to the identification of species, but it is often useless without first providing details that allow placement of the species in the correct taxonomic group. For example, a description of a brown bird with a streaked breast could indicate anything from a hawk to a sparrow.

To help students understand the importance of GISS, the instructor should begin by showing the students silhouettes of birds (Figure 1). These silhouettes can represent specific groups of birds and should start with obvious species (e.g., ducks and eagles). Students already have the basic knowledge necessary to discuss the GISS of various species, but they must learn to harness that knowledge and include it in their descriptions. Terms such as *sparrow-like*, *hawk-like*, or *duck-like* can be used appropriately in this exercise. Table 3 shows examples of the progression of descriptions through time and the instructive questions asked.

**Table 2. Instructions and suggestions for the use of Twitter during the assignment.**

Twitter Terminology & Commands	Description & Use
<b>Follow</b>	Students follow the class account to see announcements and tweets from other students on their own Twitter page. The viewing experience is improved when students follow the class account and navigate to the class account page to view colleagues' tweets.
<b>Tweet</b>	Students tweet their descriptions to the class Twitter account. Tweets (the term is both a noun and a verb) are short blurbs of text limited to 140 characters.
<b>@</b>	To direct a tweet to the class, include @ClassTwitterName (in this example, ClassTwitterName is the name of the class account) followed by the rest of the tweet. When you click Reply, Twitter automatically uses @ to direct your comment to the author of the tweet to which you are replying.
<b>Retweet</b>	Retweeting is similar to forwarding messages. By clicking Retweet at the bottom of someone's tweet, the message is placed on your homepage and becomes visible to anyone following you. All replies to the tweet will also be visible to your followers. Instructors must retweet all descriptions to ensure that students can see each other's descriptions on the class's Twitter page.
<b>Reply</b>	A reply directs your response to the author of the tweet. Instructors and students should use Reply to comment on or ask for clarifications of species descriptions.
<b>#</b>	Hashtag, unlike @, does not direct your tweet to a specific user. Instead, this creates a searchable link. If you click the link, Twitter searches for all tweets with the same hashtag. You can also search for hashtags with the Twitter search bar. When you create a new unique hashtag for the class, it can be used as a way to search for all class tweets.

**Table 3. Examples of the transformation of three selected descriptions throughout the exercise.**

	Example 1	Example 2	Example 3
<b>Original Tweet</b>	Smaller than a crow, larger than a robin, long thin bill, small head, comma-shaped spot below eye, gray-tan color, long pointed tail.	Large, hawk-like, white belly, predominantly brown wings, white crown and throat, brown mask-like strip, yellow eyes.	Hummingbird-shaped, green forehead with red throat, rusty orange back, small white breast patch, straight bill.
<b>Response</b>	You should give some indication as to the shape of the bird. What general category would you put it in? Jay-like, etc.?	From afar is the eye coloration easy to see? Is the flight distinctive? Is there other coloration that is distinctive?	Try to use the terminology. What is the colorful portion of the throat called?
<b>Second Tweet</b>	Pigeon-like, slightly decurved acute bill, small head, moderately pointed diamond tail, comma shape below eye, gray-tan colored.	H <sub>2</sub> O-loving, large, hawk-like, white belly, long, narrow brown soaring arch wings, white crown and throat, brown mask-like from eye down neck.	Small; hummingbird-shaped; green crown; dark outer primaries; red jugulum; rusty orange nape, back, and rump; small, straight bill.
<b>Number of Iterations</b>	5	4	3
<b>Final Tweet</b>	Medium-sized, pigeon-like bird with rounded head and long pointed tail. Gray-tan overall with black comma below eye and spots on secondaries.	Large, hawk-like bird found by water with white belly, crown, and throat; long, narrow, brown M-shaped wings in flight; dark eyestripe.	Small, hummingbird-shaped bird with a green crown; white breast; red gorget; rusty orange nape, back, and rump; small, straight bill.
<b>Answer</b>	Mourning Dove	Osprey	Rufous Hummingbird

## ○ Engagement Strategies

This assignment allows instructors to use popular social media for constructive learning. It allows students who might suffer from social anxiety to interact with classmates and gives instructors the ability to assess a student who might otherwise never offer input in the classroom setting. It also allows a method of honing avian identification skills and effective use of specific vocabulary in a distance-learning environment such as is increasingly popular at the university level. Some students may not be comfortable with the use of Twitter, and may even be vehemently opposed to any use of social media. Although they make up a very small percentage of each class (averaging fewer than one student per class), it is important to accommodate these students as well. In these instances, the instructor and student can conduct the same exercise through repeated e-mails. This limits the student's interactions with classmates but can be effective if necessary.

## ○ Assessment

We do not rigorously grade this assignment. Instead, we view it as a tool to improve the comprehension and use of vocabulary, identification criteria, and communication skills. Sustained participation throughout the process is important, and therefore some kind of grading can be offered to motivate students. We offer points for (1) the initial diagnostic tweet, (2) the final refined diagnostic tweet, and (3) the guesses of others' tweets separately.

We have conducted this exercise in six classes over a 2-year period. In that time, the vast majority of students who commented had enjoyed the exercise thoroughly and actively improved their descriptions. Unfortunately, we have found no way to quantitatively test for a difference in student performance based solely on this exercise.

## ○ Extensions

This exercise can be tailored to any level of education. In university ornithology classes, this exercise can be a weekly assignment with

students directed to focus descriptions on those families and orders covered each week. Instructors can use the same principles when teaching identification of any organisms, including other vertebrates, plants, and insects. As long as regional field guides or other identification materials are available to all students, the process should work in any effort to teach vocabulary associated with identification. If used as an exercise for younger students, there can be a sign-up sheet with specific birds already chosen by the instructor. Pulling species from a limited list greatly decreases the assignment's difficulty.

If students cannot access Twitter, the assignment can be completed as homework, with the name of the chosen species included as the title. Hard copies of the description without the title can be passed around the class. The class can ask questions and collectively improve the description under direction of the instructor. In this case, the original author of the description may remain anonymous.

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