Environmental Science Institute
THE UNIVERSITY OF TEXAS AT AUSTIN

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Visual Communication

Lesson plan for grades 9-12
The University of Texas at Austin
By: Geoff Hensgen

SOURCES AND RESOURCES:

- Ian Vernier's Body Language Signals Webpages: Eyes
  Part 1: http://bodylanguagesignals.com/eyes.html
  Part 2: http://bodylanguagesignals.com/eyes2.html
- Psychologist anywhere/anytime: Nonverbal communication: http://www.psychologistanywhereanytime.com/psychologist/psychologist_non_verbal_communication.htm

POTENTIAL TEKS ADDRESSED THROUGH THIS LESSON:
§112.34. Science, Grades 9-12: 1A, 2B, 2E, 2F, 2G, 2H, 3A, 12B

PERFORMANCE OBJECTIVES:
Students will be able to:

- Identify emotions associated with different eye expressions
- Articulate the role that eye structures play in non-verbal communication
- Use the scientific method to evaluate and compare the accuracy of detecting moods and emotions based on *in-situ* observation of a person's eyes

MATERIALS:
Eye Gaze Worksheet (2 per group of 2 students)
Evocative Image Powerpoint file; used to present 12 images to student "Expresser" subjects
Overhead projector to present evocative Images
Calculator (1 per group of 2 students)
Paper to block the lower part of a person's facial expression

CONCEPTS:
Oculesics is the study of the role of eyes in nonverbal communication. This includes the study of eye gaze and pupil dilation. Studies have found that people use their eyes to indicate interest in something, or reflect internal emotional states including attraction, fear, and happiness. **Pupils** not only let in light to permit visual interpretation of surroundings, studies show that they dilate when humans experience feelings of interpersonal attraction. Blinking or fluttering **eyelids** can reflect boredom, stress, or deception depending on duration and intensity of the behavior, as well as how other facial features such as **eyebrows** are used in

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combination with eyes themselves. Finally, the entire **eyeball** is often used to convey emotions based on cultural norms, such rolling the eyes upwards to express disagreement or exasperation.

BACKGROUND:

Beyond collecting vital information for an animal, eyes and the structures comprising them serve to communicate important information between individuals of a given species, and even between species. This lesson plan employs a simple non-verbal communication experiment to explore what features of the eyes are used to express human emotions, and test predictions about how effective people are at detecting emotions through photographs versus in-person. This experiment can be also be adjusted to compare visual communication and emotional detection success between males and females. Many non-verbal communication studies show that women are better than men at interpreting facial expressions and detecting emotions.

PREPARATION:

This lesson involves presenting human subjects with photographs intended to evoke feelings of happiness, sadness, humor, and fear. While these images are public domain and are not sexually explicit, teachers are encouraged to warn the class that student will be asked to view imagery that may evoke positive and negative feelings. Students who do not feel they can participate should be given alternative activities.

ENGAGE:

Teachers should engage the class by asking students to cover their lower faces with a book or piece of paper, leaving both eyes and features such as eyebrows exposed. Next, students should do three things:

1) Think about memories or ideas associated with 1 of 4 moods: happiness, sadness, fear, or humor.
2) Record the mood they imagined
3) In 5 seconds, guess the mood of one student "partner" sitting directly in front of or across from them by looking at their eyes

Afterwards, students should confer with each other to see if they guessed their partner's mood correctly.
Ask: "Who was able to correctly guess what kind of thoughts their partner was thinking?"
Students who guessed correctly should discuss what features or cues in their partner's gaze caused them to guess their mood. Students should be encouraged to discuss whether features such as dilated pupils, blinking behavior, or how wide open their partner's eyes were aided them versus features such as raised or furrowed eyebrows.

Similarly, teachers should ask students who guessed incorrectly what eye features they based their decision on, and lead the class in comparing the cues used to make successful versus unsuccessful guesses.
Teachers should then bring Ian Vernier's Body Language Signals Webpage (see SOURCES AND RESOURCES) up on an overhead projector, and briefly outline common associations between eye features and the underlying

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behavioral states they are often associated with. These are not meant to be memorized, rather they are intended to provide an introduction to possible ways that eye features are used in non-verbal communication, and underscore their importance not only in gathering information, but communicating it as well.

EXPLORE:

Teachers should instruct students to prepare to explore visual communication further by performing a non-verbal communication experiment similar but more robust than the ENGAGE activity. Students should write a 1-2 sentence hypothesis predicting what eye features convey the most information about someone's emotional state.

Students should pair up with their partners from the ENGAGE activity, and obtain the relevant group materials listed in the MATERIALS section. Teachers should bring the Evocative Image Powerpoint file up on a projector screen with the title page displayed.

Students in each group should assign themselves to be a Judge, or "Expresser". Judges must sit directly opposite their "Expresser" partner, and face away from the overhead projector screen, so they cannot see the evocative images.

Inform the class that the Teacher will present Expressers facing the projector screen a series of 12 images designed to evoke certain feelings. Expressers should cover the lower part of their faces during trials the same way they did during the ENGAGE activity. They should be instructed to act casually, and not deliberately exaggerate or conceal their emotions, or think too much about the images they are seeing.

The teacher should govern the presentation of evocative images, and only allow Judges 5 seconds to guess what kind of image their partner is seeing. Judges are to guess what kind of image their Expresser partner is viewing from the options below, and record their guesses on their Eye Gaze Worksheet:

1) Happy
2) Sad
3) Funny
4) Scary

Following the 5 second guessing period for each image, the teacher should permit Judges 10 seconds to quickly note any features of the eye or surrounding area that influenced their decision. Teachers should wait 20 seconds while displaying spacer slides before presenting the next image to allow students time to clear their minds of the last slide. After the first trial, partners should switch roles, and a second trial should be run with the slide deck presented in reverse order to prevent memory bias in partner guesses. Afterwards, the answer key to each slide number should be presented on the overhead so students can score their guesses. Calculators should be used by each student to compute an accuracy rate (% correct guesses) as a Judge.

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EXPLAIN:

Teachers should have each student report their accuracy scores by entering their name and score on an excel spreadsheet loaded on a classroom computer. Individuals with the top 5 scores should describe to the class what eye features and characteristics they noted for correct guesses.

Ask top scorers: "What eye features are being used to successfully guess the kind of image Expressers are viewing?"
Teachers should probe students to differentiate between features associated strictly with the eyeball (e.g., pupil size) or with surrounding features (eyelid gape size, eyebrow position, etc.).

Similarly, the 5 lowest scorers should also describe the cues they used despite experiencing less success in guessing the image types. If the same features are mentioned by both groups of students, teachers should prompt the class to explore other possibilities to explain differences in guessing performance:

- Could men and women differ in their degree of emotional expressivity with their eyes?
- Might there be a difference in emotional detection abilities between men and women?
- How might individual personality differences in expressivity or emotionality factor in?
- Could the degree to which one person knows the other factor into their ability to detect emotions by reading their partner's eyes?

EVALUATE:

There is potential for great variability in success rates that students have in guessing their partner's emotions based on their eyes. Learning outcomes should not necessarily be evaluated in terms of whether certain eye features were identified to be better clues than others, although any differences discovered here are excellent opportunities for students to discuss WHY they think certain features provide information about emotional states.

Teachers should evaluate whether students can 1) describe 3-4 eye features that were commonly used to predict emotional states and 2) articulate how these eye features convey benefits to the social (and therefore ecological) functioning of a person beyond gathering and organizing visual information. The key concept that students must demonstrate is that eyes can communicate information to other animals about an organism's internal state, in addition to gathering information about its external environment. Furthermore, students must explain whether their initial predictions (hypotheses) were supported or not by the experiment data.

ELABORATE:

- Have groups evaluate the trial data for the entire class by the sex of the Judge and Expresser:

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- Do women have higher average accuracy than men across both trials?
- When women were Judges, what percentage of their partners were men and women?
- Could the sex of the Judge or Expresser influence accuracy in guessing emotions based on eye features?
- How would one design an experiment to more directly address whether men or women are better Judges of emotional states based on a person's eyes? In this experiment, how would one control for potential differences in expressiveness that may exist between men and women?

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Eye Gaze Worksheet

Judge: _____ Male____ Female____
Expresser: _____ Male____ Female____

Slide Number	Predicted Emotion	Actual Image	Correct?
		Percent Correct:	