

# The Intimate Machine

*Activity 2: Grades 5-8*

## **Making Faces**



Computers that have a more human appearance may promote a greater level of interchange and trust in their interactions with people. As you saw in "[Friendly Characters](#)," by developing machines capable of body language and facial expression, researchers hope to expand the level of communication between man and machine.

Psychologists have identified basic facial expressions that most people can easily recognize and identify. Each expression conveys a distinct emotion. These expressions are constructed through changes in a variety of facial features. In this activity, you'll get the opportunity to construct model faces that communicate using facial features including the mouth, eyes, and eyebrows.

This activity page will offer:

- An experience in analyzing facial features as they relation to emotions
- An opportunity to create and explore six basic facial expressions
- A chance to survey others on expression appearance

## **MATERIALS**

- Push pins
- Scrap section of foam core or a square of corrugated cardboard (about the size of a book cover)
- Large red rubber band
- Glue stick
- Colored paper
- White paper
- Markers
- Crayons

## PROCEDURE

1. Work with a partner. Use a glue stick to attach a clean sheet of white paper to the surface of your foam core or cardboard.
2. Draw a large oval onto the paper to represent the outline of a human head.
3. Use two push pins to identify the corners of the mouth. Stretch a rubber band around these pins to form the lips.
4. Use colored paper to create two identical circular eyes. Each eye should be about the size of a quarter. Position these eyes on the face model.
5. Cut out two small identical paper rectangles. These rectangles will represent eyebrows.
6. Draw and cut out a basic nose shape. Use tape to position this feature to the face.
7. Examine the completed face. Does it convey an expression associated with an emotion? If so, describe the emotion.
8. Check out this group of six basic facial expressions. According to psychologists, each should be distinct and easily distinguishable from the others: Joy, Sorrow, Disgust, Surprise, Fear, Anger.
9. Work with another team of two. Without letting the other team see your team at work, tweak your basic face model to represent one of these six emotions. The other team should do the same. Try altering the size and shape of the mouth by adding new pushpins, changing the eyebrow position, attaching eyelids to the eyes, or adding frown lines to the face.
10. When you have completed your expression, show your face to the other team and ask them to do the same. Can they guess which of the six emotions your team was trying to convey? Can you guess theirs? Continue until each team has constructed all six expressions.

## Questions

1. Which expression did the other team most easily identify? Why?  
**(Accept all reasonable answers)**
2. Can changing a single facial feature produce six distinct facial expressions?  
**(Accept all reasonable answers)**
3. Based upon your results, which one facial feature seems the most significant in communicating expression? Can you suggest reasons for its significance?  
**(Accept all reasonable answers)**

## One Step Further

The six expressions cited above are the most basic and easiest to decipher as identified by Paul Ekman, one of the leaders in facial recognition. Can you think of other emotions and expressions that also present a characteristic appearance? If so, build them on your face board and share them with the class.

## **EXTENSIONS**

### **Emoticons - Humanizing Screen Characters**

Have you ever seen the following symbol sets created by a computer? :) or :-)  
To most, these symbols represent a happiness. Likewise, the symbols :( or :-(  
represent unhappiness. The symbols are called "emoticons," short for  
emotional icons. Now it's your turn to create additional emoticons. Create  
emoticons that convey other feelings such as surprise, confusion, and anger.  
Share these symbols with classmates to see if others agree with the messages  
you wish to communicate.

### **A Digital Record**

How easy is it to duplicate and differentiate the six expressions identified in  
the activity above using a real face? Obtain a digital camera and capture a  
series of six images of friends or family members exhibiting each of these  
emotional states. Identify the printouts by a number code. Share your images  
with another group of students. How well can they distinguish the six  
expressions? What other expressions can you capture and distinguish with a  
camera?

### **Endearing Robots**

R2D2 and C3PO are two of the most famous robots of science fiction. What  
makes these robots so lovable and human-like? Do they have variance in facial  
features? Do they have distinct personalities? What traits do we see that  
humanizes these mechanical characters?

### **Tricks of the Tricksters**

Have you ever seen a magician who claims to read minds? If so, perhaps that  
person had an assistant working in the audience. This assistant is often used  
to gather information from unsuspecting audience members. Then, using body  
signals, the assistant may communicate information to the performer. Now it's  
your turn. Work with a partner. Create a language of body movements that  
you could use to communicate a date to each other (such as October 20th)  
without others being aware of your secret communication. Think about it.  
What type of body movements would be most difficult to detect as  
communication cues? Which would be the easiest to spot? Test your  
communication strategy in front of classmates.

## **WEB CONNECTION**

### **Face Robot**

<http://www.ifi.unizh.ch/groups/ailab/people/hiroshi/face.html>

A very different type of site that has QuickTime movies showing the  
movements of a Face robot.

### **On Analysis of Facial Expression**

*<http://www.cs.tut.fi/~tsoumani/dip3/>*

A uniquely illustrated site that presents a scientific approach to the analysis of facial expressions.

### **Paul Ekman Publications**

*<http://www.paulekman.com/frame.html>*

A set of articles that explain the work of psychologist Paul Ekman on facial expression and emotion.

The activities in this guide were contributed by Michael DiSpezio, a Massachusetts-based science writer and author of "Critical Thinking Puzzles" and "Awesome Experiments in Light & Sound" (Sterling Publishing Co., NY).

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### **CURRICULUM LINKS**

#### **General Science:**

Observation and Inference

#### **Life Science:**

Communication of Emotions

### **NATIONAL SCIENCE STANDARDS (Grades 5-8)**

#### **Science as Inquiry- Content Standard A**

Students think critically and logically to make the relationships between evidence and explanations by deciding what evidence should be used and forming logical arguments.

Students will practice communicating scientific procedures and explanations. They will gain competency in following instructions, describing observations, communicating experimental methods, and summarizing their results and the results of other groups.

### **Science and Technology - Content Standard E**

Students will collaboratively develop, implement, and analyze strategies for communication.

### **Science in Personal and Social Perspectives - Content Standard F**

Students explore how technology can influence quality of life and human interactions with computers.