

Ask®

Face to Face

Most species in the animal kingdom use the face for a combination of identification, expression, and functionality. This issue of ASK magazine examines these uses through its collection of expository nonfiction articles.

CONVERSATION QUESTION

How do faces convey information?

TEACHING OBJECTIVES

- Students will learn how facial features of animals are utilitarian as well as expressive.
- Students will learn the pros and cons of realistic robot faces.
- Students will learn how facial reconstructions are executed.
- Students will compare and contrast elements within a species.
- Students will construct arguments based on evidence.
- Students will sequence and explain a studied process.
- Students will write an origin story to explain how an animal got its unique anatomical feature.
- Students will contribute an art page to a class book: *Funny Faces*.
- Students will use a mathematical process to solve theme-related word problems.



In addition to supplemental materials focused on core STEM skills, this flexible teaching tool offers vocabulary-building activities, questions for discussion, and cross-curricular activities.

SELECTIONS

- **What Are Faces For?** Expository Nonfiction, ~840L
- **Should Robots Have Faces?** Expository Nonfiction, ~930L
- **What Did King Midas Look Like?** Expository Nonfiction, ~910L

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What Are Faces For?

pp. 6–13, Expository Nonfiction

This article educates readers about the purpose and function of different facial features. Fascinating animal facts and the communicative properties of human faces are the central focus of this high-interest article.



RESOURCES

- Compare and Contrast: Face the Facts

OBJECTIVES

- Students will learn how facial features of animals are utilitarian as well as expressive.
- Students will compare and contrast elements within a species.
- Students will write an origin story to explain how an animal got its unique anatomical feature.

KEY VOCABULARY

- **frond** (p. 7) a long leaf that has many small parts sticking out on either side, like a feather; an animal body part that looks like a frond
- **muzzle** (p. 13) the long nose and mouth of an animal such as a dog, horse, or pig

ENGAGE

Conversation Question: How do faces convey information?

Ask the class to draw emoji faces that represent these feelings: joy, anger, disgust, fear, sadness, surprise. Then tell students that scientists believe people are born with the ability to make and recognize these six basic expressions. Discuss information that can be gathered by “reading” a person’s facial expressions. Why might being able to read a person’s expressions be an important social skill?

INTRODUCE VOCABULARY

Post and discuss the vocabulary terms. Use the photographs on pages 7 and 8 to help students understand the word meanings. Then have students fold a piece of paper into quarters, label two of the boxes with the key words, and make a visual representation of each. After reading the article, they will use the other two boxes to illustrate additional theme-related vocabulary words from the text.

READ & DISCUSS

Reinforce comprehension of the concepts presented in the article by using the following questions to direct discussion.

1. Why did faces evolve?
2. How do animals use their faces?
3. Give three examples of animals that have useful facial features.
4. Why is the human face one of the strangest in the animal kingdom?
5. What is the main job of human faces?
6. How do facial muscles help humans communicate?
7. How do humans “read” expressions?

SKILL FOCUS: Compare and Contrast

INSTRUCT: Students will compare and contrast different categories within a species. Discuss the categories by introducing the *Compare and Contrast: Face the Facts* worksheet. Have students work in pairs to revisit the text and underline information that will help them complete the worksheet. Partners should record the data on the chart.

ASSESS: Reconvene and review the worksheet. Invite students to read their comparison paragraphs aloud.

EXTEND

Language Arts: Explain that cultures around the world have different origin stories that explain how something came to be—for example, where thunder comes from or how a leopard got its spots. Some stories are more factual while others are more imaginative. Read aloud an updated version of “How the Elephant Got Its Trunk” from Rudyard Kipling’s book *Just So Stories*. Next, point out that the article presents information about the unusual features of different animals, such as the long face of an anteater and the big ears of a leaf-nosed bat. Have students choose an animal from the article and write a story to explain how it got its unusual features. Stories should include a beginning, middle, and end. Fantastical details and descriptions will add interest.

Face the Facts

Compare and Contrast Use information in the article to answer the questions below. Then complete the THINK TANK activity.

Categories	How are they similar?	How are they different?
megabats and microbats		
prey animals and predator animals		
vertebrates and invertebrates		

THINK TANK: Choose one of the pairs above and assemble the information from the chart into paragraph form.

Should Robots Have Faces?

pp. 16–19, Expository Nonfiction

Technological advancements are lifting robots from sci-fi movies and inserting them into everyday life. Readers will explore the dynamics of this modernization and the discrepancies in the appearances of different robotic creations, specifically their faces.



RESOURCES

- Construct Arguments: About Face
- Face Template

OBJECTIVES

- Students will learn the pros and cons of realistic robot faces.
- Students will construct arguments based on evidence.
- Students will contribute an art page to a class book: *Funny Faces*.

KEY VOCABULARY

- **interact** (p. 16) to talk or do things with others
- **crease** (p. 17) form lines or folds in something
- **accustomed** (p. 19) familiar with something so that it seems normal or usual

ENGAGE

Conversation Question: How do faces convey information?

Give students five minutes to draw a robot. Upon completion, allow students to do an art walk around the classroom to view their classmates' creations. Pose the following questions for consideration: *What do the drawings have in common? How are they different? How do the robots resemble humans? Why do they resemble humans?* Introduce the article "Should Robots Have Faces?"

INTRODUCE VOCABULARY

Post and discuss the three vocabulary words and definitions. Have students Think-Pair-Share with a partner. Give them the following directives, one at a time:

1. In what ways do humans **interact** with animals?
2. How can you **crease** paper to make a fan?
3. How could you become **accustomed** to living in a new town?

READ & DISCUSS

As a post-reading activity, lead a discussion based on these questions:

1. What questions did Maja Mataric' consider when developing a robot to help her in her work with autistic children?
2. Explain the "uncanny valley." Do you think the effect is real?
3. How do Dave Hanson's robots "read" faces?
4. Do Mataric' and Hanson both make valid points? Elaborate.

SKILL FOCUS: Constructing Arguments

INSTRUCT: Students will construct arguments using evidence that supports two different positions: *Robots SHOULD have faces.* / *Robots SHOULD NOT have faces.* Guide students to acknowledge that these two viewpoints represent the opposing opinions of Mataric' and Hanson. Students should provide at least two pieces of evidence directly from the article (cite with page number) and provide their own reasoning for the third point on the *Construct Arguments: About Face* organizer.

ASSESS: Review and discuss the supporting evidence students listed on the chart. Ask students if they vote YES or NO and tally results.

EXTEND

Art: This flipbook activity will engage students of all artistic abilities. Make copies of the *Face Template* on cardstock and distribute to students. Have students use markers to add features to the face. Encourage them to use details and effort. Then collect the artwork and bind the pages by stapling them together along the left margin. Next, cut the two lines through each face so the three sections can be flipped separately. Create a book cover with the title *Funny Faces* and attach to the pages. Make connections by questioning why flipping parts of the face so that they are mismatched can be funny or unsettling. Does this support the viewpoint of Mataric' or Hanson?

About Face

Construct Arguments Support the positions below by using evidence from the text. Cite information using page numbers. For point number three, you may provide your own reasoning.

***YES**, robots should have faces.*

1.

2.

3.

***NO**, robots should NOT have faces.*

1.

2.

3.

Circle the word **YES** or **NO** to confirm your opinion on the topic above. Discuss your viewpoint with a partner.

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What Did King Midas Look Like?

pp. 24–28, Expository Nonfiction

When the tomb of King Midas was discovered, archeologists did not find gold. Instead, they found a team of scientists eager to reconstruct the face of the ancient ruler. This article explores the materials, methods, and effort needed to accomplish this task.



RESOURCES

- Sequence a Process: Saving Face

OBJECTIVES

- Students will learn how facial reconstructions are executed.
- Students will sequence and explain a studied process.
- Students will use a mathematical process to solve theme-related word problems.

KEY VOCABULARY

- **excavating** (p. 25) uncovering something by digging away and removing the earth that covers it
- **anthropologists** (p. 25) scientists who study humans, including their customs, beliefs, food, art, music, and family relationships
- **reconstruct** (p. 25) to build something again after it has been damaged or destroyed

ENGAGE

Conversation Question: How do faces convey information?

Students may be familiar with King Midas as the ruler with the golden touch, although this is a mythical story. Ask students to consider whether having the “Midas Touch” would be a benefit or a burden. Inform the class that the real King Midas was a king of the ancient land of Phrygia (now Turkey) in the 8th century. Most likely the legend was born from the extraordinary wealth of his kingdom. Introduce the article “What Did King Midas Look Like?”

INTRODUCE VOCABULARY

Post and discuss the key vocabulary. Provide groups of students with actual Scrabble tiles or print out a letter/value sheet online. Have students list the point value for each letter and add up the sum. Then instruct them to put the three words in order from lowest value to highest value. During a quiet period allow students to revisit the article to determine the word from the article that has the highest point value.

READ & DISCUSS

Post and discuss questions prior to reading. Have students read the article independently and answer the questions in full sentences.

1. What is the legend surrounding King Midas? What is the reality?
2. What can scientists learn from a person’s skeleton?
3. How do muscle and skin measurement charts aid in facial reconstruction?
4. How did Neave test that his reconstruction methods were accurate?
5. How did Neave study the Fayum mummies without unwrapping them?

SKILL FOCUS: Sequence a Process

INSTRUCT: Review the article and guide students to notice that there is a specific process involved in reconstructing a face from a skull. Distribute the *Sequence a Process: Saving Face* graphic organizer. Instruct students to condense the process into four important steps that detail how scientists are able to recreate facial features from bones.

ASSESS: Circulate as students are working and have them retell the process in their own words. Collect and evaluate charts for accuracy.

EXTEND

Mathematics: Show students how to use the internet to look up the current price of an ounce of gold. Then have students use the R-D-W (Read-Draw-Write) process to answer the following questions:

- A. What is the price for five ounces of gold? (**Answer:** $5 \times$ gold price)
- B. How much would one pound of gold cost? (*Remind students that 1 pound = 16 ounces.*) (**Answer:** $16 \times$ gold price)
- C. If you used the Midas touch to turn your desk—weighing 20 pounds—into gold, how much money would it be worth? (**Answer:** $[20 \times 16] \times$ gold price)

Saving Face

Sequence a Process Reread the article and highlight sentences that detail the process of facial reconstruction. Condense the process into four steps and explain each step in the correct order.

First...

Next...

Then...

Finally...