



ACTIVITY 10

Cognitive Skills in Communication

PRESENTATION

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ACTIVITY SUMMARY

Students apply what they've learned about cognition to create Public Service Announcements (PSAs) that communicate important information about Southsard fever. They evaluate one another's PSAs for cognitive shortcuts and cognitive biases and refine their own PSAs based on peer feedback. Students reflect on how different types of cognition affect how they obtain and communicate information in their daily lives.

ACTIVITY TYPE
PRESENTATION

NUMBER OF
40-50 MINUTE
CLASS PERIODS
2-3

KEY CONCEPTS & PROCESS SKILLS

- 1 Slow thinking relies on careful reasoning and is useful for complex or higher-stakes situations. Slow thinking takes time and effort but is less prone to cognitive error when evaluating information and reaching conclusions.
- 2 There are many cognitive biases that shape the way people make conclusions, including confirmation bias, conflict of interest, conformity bias, and emotion bias. Recognizing these biases can lead to improved reasoning.
- 3 Cognitive shortcuts and cognitive biases can lead to cognitive errors that affect how one chooses and reasons about evidence related to a claim.
- 4 Confirmation bias is a common bias that leads to faulty reasoning. It is a result of the unintentional misuse of evidence to support an existing belief.

CONCEPTUAL
TOOLS



NEXT GENERATION SCIENCE STANDARDS (NGSS) CONNECTION:

Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically). (*Science and Engineering Practice: Obtaining, Evaluating, and Communicating Information*)

VOCABULARY DEVELOPMENT

public service announcement (PSA)

(assumed prior knowledge)

an educational message created to raise awareness and change people's attitudes or behaviors

MATERIALS & ADVANCE PREPARATION

FOR THE TEACHER

- VISUAL AID 9.1
"Recommendations for Reducing Risks from Southsard Fever"
- VISUAL AID 9.2
"List of Cognitive Shortcuts and Cognitive Biases"

FOR EACH STUDENT

- PSA SUPPLIES
(OPTIONAL)
- STUDENT SHEET 1.3
"Unit Concepts And Skills"
(OPTIONAL)

Consider in what form you would like your students to prepare their PSAs. Some options include paper, video, audio recording, meme, large poster, or digital drawing. Prepare any templates or materials you would like students to use.

Prepare a few examples of PSAs to share with your students in the Getting Started section. Choose PSAs that are appropriate and applicable to your student population. The following are some suggested resources for successful PSAs:

- The Ad Council: *Browse Campaigns*
- National Foundation for Infectious Disease: *Public Service Announcements*
- CDC Tips from Former Smokers: *Campaign Resources: Tips From Former Smokers*
- Seize the Awkward: *Seize the Awkward*

TEACHING NOTES

Suggestions for **discussion questions** are highlighted in gold.

Strategies for the **equitable inclusion of diverse students** are highlighted in light blue.

GETTING STARTED (10 MIN)

1 The class discusses what makes a successful public service announcement (PSA).

- Have students read the Introduction in the Student Book. Let them know that they will be making PSAs. Review the features of an unbiased PSA from the Introduction:
 - a clear way to take action
 - use a relatable messenger
 - memorable and seen often enough
- Share the PSA examples you have prepared (See Advance Preparation). Have the class briefly analyze each example for the features listed above.
- For the PSA examples, have students identify any cognitive biases, cognitive shortcuts, or evidence used and discuss their effectiveness. You may also want to share a few historical examples that were not as successful, as a contrast, since pairs will be creating biased PSAs and then working to improve them into unbiased PSAs. Most of these unsuccessful examples included extreme scare tactics that caught attention and/or engaged in fast thinking, but they were not effective.

PROCEDURE SUPPORT (40-60 MIN)

2 Support students as they create biased PSAs.

- Review Procedure Steps 1–2 as a class. Clarify any questions that students have about the task. Review Southsand City Health Department’s recommendations by displaying Visual Aid 9.1, “Recommendations for Reducing Risks from Southsand Fever,” which was originally introduced in Activity 9. (The recommendations can also be found in Activity 9, Procedure Step 1 in the Student Book.)

- If you have additional requirements that students must include in their PSAs, be sure to let them know before they begin. You might consider assigning recommendations to each pair or group in order to make sure there is a variety in the whole class.
- For students who need more support creating a visual product, you may want them to create a PSA by using whatever modality is most comfortable, such as verbal (story), scrapbook (photos), or audio (recording).
- In Procedure Step 3, students create biased PSAs that take advantage of cognitive shortcuts and cognitive biases. At this point, let students know that they will eventually revise their PSAs to be unbiased. It might be helpful to review ways to recognize the different cognitive shortcuts and cognitive biases introduced in Activities 3 and 5. Help students think of ways they could include these shortcuts and biases in their PSAs, such as:
 - focusing on extreme emotions.
 - highlighting worst-case scenarios or magical solutions.
 - sensationalizing the content.
 - referring to readily available ideas.
 - repeating a phrase several times.
- Display Visual Aid 9.2, “List of Cognitive Shortcuts and Biases,” again to remind students of the biases and shortcuts they can include in their biased PSAs.
- If time and inclination allow, you may want to have students incorporate other cognitive shortcuts and cognitive biases not included in this instructional unit. Make sure these are identified by student creators for others who may not be familiar with those shortcuts and/or biases.
- In Procedure Step 4, have pairs trade their biased PSAs with another pair’s biased PSA. Support students as they review each other’s PSAs. Remind them to use the skills from the unit to look for misuse of evidence, cognitive shortcuts, cognitive biases, and/or fast thinking.
- After Procedure Step 4, have a class discussion about the biased PSAs. Ask students to share what types of cognitive shortcuts and cognitive biases they found to be the most impactful. Have students share how these features might affect a reader’s thinking. Students might respond that features such as focusing on worst-case scenarios might make readers fearful and more likely to act.
- In Procedure Step 5, it may be helpful to offer some general strategies that students could use to improve the biased PSAs to make them less biased and misleading. Some ideas might include:
 - not focusing on negative emotions or worst-case scenarios.
 - making sure there are actual facts in the PSA.
 - not using sensational language or things such as ALL CAPS, bold type, and/or exclamation points.

3 Students give feedback on each other's biased PSAs.

- As each pair works through Procedure Steps 6–7, support them as they review another pair's PSA, provide feedback to make that PSA less misleading and reduce cognitive bias, and listen to the other pair's suggestions for improving their PSA. Remind students that they should make sure their PSAs are still engaging and interesting. Also remind students to think about the features of unbiased PSAs from the beginning of the activity. Their PSAs should give readers a way to take action, be relatable, and be memorable.

SYNTHESIS OF IDEAS (40 MIN)

4 Students present their PSAs to their classmates

- In Procedure Step 8, students present their unbiased PSAs to the class. They can explain the changes they made to their biased PSAs and then show their original PSAs for the class to see how both PSAs compare. Students should be able to identify how they reduced the cognitive biases and cognitive shortcuts when making their revisions.
- Another option for presenting the PSAs, especially for diverse student populations that may struggle with a traditional presentation, is to conduct a Gallery Walk in the classroom where all PSAs are on display, and students walk around and view them. Alternatively, you could create a digital display space for the PSAs where students can provide feedback.

- Student presentations will vary depending on the recommendation chosen, the cognitive short-cuts and cognitive biases included, the medium used, and students' creativity. The following shows a sample of possible student responses.

RECOMMENDATION	BIASED PSA	UNBIASED PSA
Soil Stabilization	Wet It or Regret It Don't let your backyard become a community health hazard!!!! All your smart neighbors are wetting the dirt before it becomes a HOTBED of Southsand fever. Wet soil traps the Southsand fever spores before they can ever reach your lungs. Don't get left behind! Start flooding your yard!	Stop the Dust, Stop the Disease Digging up dirt can release Southsand fever spores hidden in the soil. Always wet down the soil thoroughly before and during any digging projects, big or small. Don't let the dust fly in your breathing spaces. Keep fungal spores in the ground and out of your lungs! #StoptheDust
Protective Gear	Masks Are Cool Do you want to get sick with Southsand fever like all those people in the headlines? Don't be caught without wearing an N95 mask! They are SOOOO TRENDING right now. I have been selling top-quality masks for years, and 100 happy customers can't be wrong. This is the easiest way to protect your lungs so you can keep doing the things you love. #MaskUp	Your Lungs Deserve Clean Air Windy day or working in the dirt? Invisible Southsand fever spores travel on dust. Don't take the risk. Wear a fitted N95 mask when outdoors in dusty conditions to filter out harmful fungi before you breathe it in. Indoors, a HEPA filter will keep your indoor air clean and safe. Protect yourself to stay in the game.
Diagnostic Testing	You Don't Have the Flu!!! There were 1,000 new cases of Southsand fever that have been diagnosed incorrectly this year, and you shouldn't be one of them! The new diagnostic blood test can result in cutting the number of cases in half by giving you correct results so you can get early treatment. When you go to the doctor, you want them to confirm what you already know—you have Southsand fever!!! Start with the right diagnosis from a GENUINE diagnostic blood test. Get the clarity on your symptoms that you deserve!	Correct Diagnosis Matters Health workers: Southsand fever mimics the flu or pneumonia, causing treatment delays. If a patient in our area has persistent respiratory symptoms, consider a fungus in addition to familiar pathogens. Don't guess at a diagnosis—order the specific Southsand fever diagnostic blood test immediately. Early diagnosis ensures correct treatment.
Public Education	Don't Be Stupid About Symptoms The symptoms of Southsand fever are a NIGHTMARE!!! You should be frightened about what happens if you get Southsand fever! Knowing the symptoms will make you even MORE SCARED. If you are really tired and your cough won't quit, you might have Southsand fever. It's time to ask your doctor about Southsand fever. Don't lose another week to the unknown.	Southsand Fever: Know the Signs If you live in a dusty region and have been near dirt lately, be aware of the symptoms of Southsand fever: • a cough that won't quit. • a fever for more than one day. • extreme fatigue. Don't ignore persistent symptoms. Know the signs and ask your doctor about Southsand fever today. #CheckYourCough

5 Compare and contrast students' two PSAs.

- In Procedure Step 9, have pairs discuss the experience of creating a biased PSA and an unbiased PSA. Ask, **What was challenging about creating each type of PSA?** Students might say that it was hard to create an interesting PSA without incorporating some of the features such as appeals to emotion and sensational language.
- This discussion (from Procedure Step 9) should lead to the central idea of the activity. Use the questions provided in the Student Book as a guide for the discussion.

Sample Student Response, Procedure Step 9

I see cognitive shortcuts and cognitive biases all the time online. Now that I can identify them, it seems obvious that people use them to grab attention and create certain reactions. I really notice the emotion bias in my feed. I am not sure if it is unfair. On one hand, it seems to get attention; on the other hand, I don't think it works over the long term. These shortcuts and biases might catch attention initially, but they are not persuasive in changing action. It would be easy to make a rule against using them, but that would never work. I think more awareness and education is a good idea.

6 Generalize the experience in the activity to everyday media communications.

- Relate the strategies discussed in students' PSAs to advertisements in general. Review Connections to Everyday Life item 4, which relates to how product advertising often takes advantage of cognitive shortcuts and cognitive bias in potential customers. Ask students to reflect on how the ideas in this activity affect how they look at product advertisements.
- Relate the ideas of biased advertisements and promotions to the conclusion from Activity 3 when students investigated the effectiveness of fast thinking in news headlines.

7 Summarize the key concepts and process skills of the unit.

- You may wish to revisit optional Student Sheet 1.3, "Unit Concepts and Skills," to help students formally organize the ideas introduced in the unit. Students can place the headings of any remaining main ideas from the unit into the organizer and add examples from their classroom experiences in Activities 8–10. See the end of Activity 1 in the Teacher's Edition for a sample student response.
- Finish the activity by revisiting the Guiding Question, *How can you apply knowledge of cognition to communicating information?* Use responses to this question to formatively assess students' understanding of the key concepts and process skills related to how cognitive biases appear in our everyday communications.

- Revisit the Unit Driving Question, *How can people evaluate their thinking about everyday issues, such as health and disease?* Over the course of the unit, students have been introduced to practical skills to help them think about the different types of information they encounter in their lives. They've learned about the concepts of cognition and different types of cognition, such as fast thinking, slow thinking, and cognitive bias. They have begun practicing using an actively open mindset to reduce the effects of bias, and they have seen how slow thinking and an actively open mindset can improve the scientific process.
- Ask students to reflect on the application of the unit content to their everyday lives. Ask, **How can using the skills you learned in this instructional unit help you make better judgments and decisions about your life?** Accept all responses and let students know that while awareness is the first step, they'll have to continue to practice slow-thinking techniques and an actively open mindset more and more often as they evaluate information related to more complex challenges as adults.

SAMPLE STUDENT RESPONSES

BUILD UNDERSTANDING

- ① In this activity, you compared a cognitively biased PSA to an unbiased PSA. Describe a situation in which you would want to receive information that is more like

a the biased PSA.

I would be okay with more biased information when it is related to something that doesn't have big consequences, like choosing what activity to do with my friends this weekend, or maybe even when considering which product to buy.

b the unbiased PSA.

I want to receive unbiased information from my doctor when I need to make a decision about my health, or unbiased product reviews when I need to make an important purchase.

- ② Think about the media (news articles, posts, videos, images, music) you consume every day. How have your experiences with this instructional unit changed your thinking about how to process that media information?

I will probably use both fast thinking and slow thinking when I respond to different media. I will try to use more slow thinking. I tend to get upset at posts, so being able to know when there is a cognitive bias could probably calm me down. It will help to use an actively open mindset to identify when cognitive shortcuts and cognitive biases are in play.

- ③ Southsand fever is based on a real-life disease called Valley fever. Scientists began investigating Valley fever in the late 1800s. One set of researchers, Emmett Rixford and Thomas Caspar Gilchrist, isolated the organism causing the disease and thought it looked like a type of protozoa called *Coccidia*. They sometimes found mold growing on their petri dishes and dismissed this mold as a contaminant instead of a pathogen. Rixford and Gilchrist's ideas matched the thinking of earlier doctors studying the disease. Explain how fast thinking and/or confirmation bias may have played a role in their conclusions.

They could have relied on the availability shortcut to make a conclusion about the type of pathogen at the beginning of their investigation. If they had looked at the work of the earlier doctors, this may have been what came to mind most easily. This developed into confirmation bias when they decided to ignore the mold growing on the petri dishes as a contaminant, instead of considering the alternative possibility that the mold was the actual pathogen.

CONNECTIONS TO EVERYDAY LIFE

- ④ Product advertising often relies on messaging that appeals to people through cognitive shortcuts and cognitive biases. Imagine a popular skincare brand that markets one of their products as environmentally friendly.

- a** How could the product advertisements take advantage of cognitive shortcuts or cognitive biases in people who value environmental protection?

The ads may take advantage of confirmation bias by emphasizing how few resources the product uses or ways that it can be recycled. They might use an eco-friendly image or slogan. This could lead someone to buy the product not because it's a good product, but because they think it is good for the environment.

- b** How could skills from this unit help you evaluate claims in the advertisement?

I'd want to check my thinking and see how my existing beliefs have influenced my reaction to the product. I'd also want to look for evidence for and against any claims made about the effectiveness of the product or its environmental impact.