Grade 8



SKILL SHARPENERS

STEAM

Grade 8

Connecting School and Home

Downloadable Teaching Guide

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How to Use This Guide

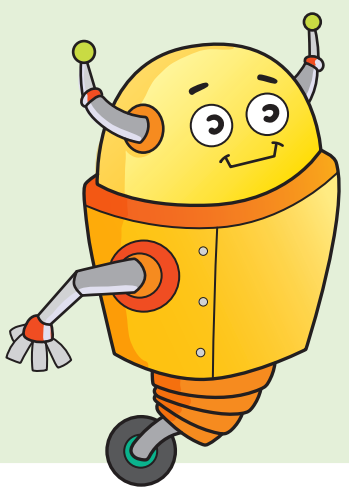
This guide provides suggestions and support to help you use *Skill Sharpeners: STEAM* as part of your core curriculum. The information and practice in *Skill Sharpeners: STEAM* introduce students to real-world problems in relatable contexts. The activities and projects focus on Science, Technology, Engineering, Art, and Math and provide hands-on experiences as well as connections to real-world scenarios and careers. The discussion questions and field trip suggestions provided in this guide will help you extend learning through additional conversations and real-world experiences.

How to Use the STEAM Approach to Education

STEAM is an approach to education that focuses on using Science, Technology, Engineering, Art, and Math to solve real-world problems. Empathy is at the core of STEAM education. Understanding how people, animals, or things are affected by a problem is an important part of the problem-solving and solution-seeking process. Teaching children how to think creatively prepares them for new unknown technologies, industries, and careers.

With STEAM activities and tasks, the final product is not as important as the process. Through the process of experimenting and exploring, your child is using creative and critical thinking skills. Scientists, mathematicians, engineers, and artists use the same critical thinking skills to find new and innovative solutions.

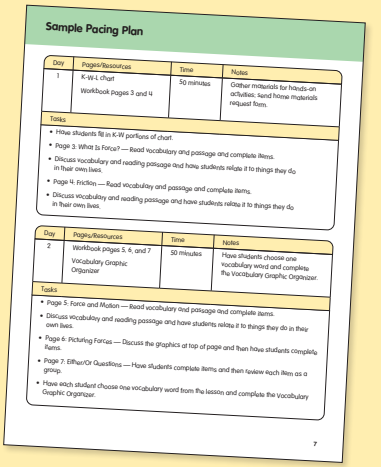




How to Use the Sample Pacing Plan and Template

The number of days you spend on each unit will depend on how you are using this resource. You may be using it to supplement your core curriculum or as part of a hybrid learning model.

The sample pacing plan is based on a 7-day lesson plan. Each day includes the *Skill Sharpeners: STEAM* workbook page numbers and suggested resources, the duration of the practice, relevant notes, and the tasks for that day. Refer to the sample plan to see examples of how and when to incorporate discussion questions, literature references, and field trips into your lesson plans.


Sample Pacing Plan

Day	Pages/Resources	Time	Notes
1	K-W-L Chart Workbook pages 3 and 4	50 minutes	Gather materials for hands-on activities; send home materials request form.

Tasks

- Have students fill in K-W portions of chart.
- Page 3: What Is Force? — Read vocabulary and passage and complete items.
- Discuss vocabulary and reading passage and have students relate it to things they do in their own lives.
- Page 4: Friction — Read vocabulary and passage and complete items.
- Discuss vocabulary and reading passage and have students relate it to things they do in their own lives.

Day	Pages/Resources	Time	Notes
2	Workbook pages 5, 6, and 7 Vocabulary Graphic Organizer	50 minutes	Have students choose one vocabulary word and complete the Vocabulary Graphic Organizer.

Tasks

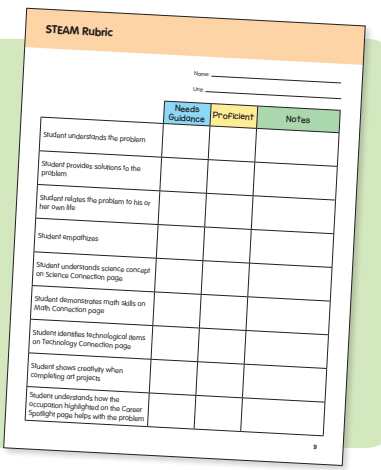
- Page 5: Force and Motion — Read vocabulary and passage and complete items.
- Discuss vocabulary and reading passage and have students relate it to things they do in their own lives.
- Page 6: Picturing Forces — Discuss the graphics at top of page and then have students complete items.
- Page 7: Either/Or Questions — Have students complete items and then review each item as a group.
- Have each student choose one vocabulary word from the lesson and complete the Vocabulary Graphic Organizer.

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How to Use the STEAM Rubric and the Graphic Organizers

The STEAM Rubric can be used to measure and summarize students' understandings and competencies after they complete each unit.

The graphic organizers are intended to be used for field trips and virtual field trips. They provide a structure for students to record information as well as their observations and feelings.


STEAM Rubric

Name: _____

Unit: _____

	Needs Guidance	Proficient	Notes
Student understands the problem			
Student provides solutions to the problem			
Student relates the problem to his or her own life			
Student empathizes			
Student understands science concept on Science Connection page			
Student demonstrates math skills on Math Connection page			
Student identifies technological items on Technology Connection page			
Student shows creativity when completing art projects			
Student understands how the occupation highlighted on the Career Spotlight page helps with the problem			

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How to Use the Discussion Questions

This guide includes discussion questions for each Learn About the Problem nonfiction text. The discussion questions are intended to help students connect the topic to their own lives and deepen their understanding of how a problem can affect people, animals, a community, or a whole city—a problem can even affect an entire region. After students read the Learn About the Problem text, engage them in discussion about the topic. Explain to students that there are no right answers, and encourage them to share their experiences and opinions.



How to Use the Literature Suggestions

The literature suggestions in this guide focus on different aspects of a topic. You may choose to read the fiction and nonfiction books to students before beginning the unit, during the unit, or after the unit. Encourage students to think about how they would feel if they were the person in the story or they were experiencing the situation the story describes.

When to Do the Field Trips

The field trips may be most valuable after students complete the Connections activities and have read and completed the Career Spotlight.

The field trips and virtual field trips are intended to deepen students' understanding of the topic and extend their learning by having authentic or virtual experiences. As students participate in the field trips, encourage them to share their observations and ideas. At the end of the field trip, you may wish to have students share any solutions they come up with and have them think about how they can apply what they have experienced to their STEAM task.



Sample Pacing Plan

Unit: Music Education

Day	Pages/Resources	Time	Notes
1	Workbook pages 6 and 7 Workbook pages 8 and 9 Discussion questions, page 14 of this guide	60 minutes	Preview discussion questions on page 14 of this guide before the lesson.

Tasks

- Page 6: "Why Can't We Make Music?" Discuss the title and photos and have students share what they think the story is about.
- Have students read "Why Can't We Make Music?"silently to themselves.
- Page 7: "Is Music Important?" Have students complete the activity independently.
- After students complete the activity, have them share their responses with the class.
- Pages 8 and 9: "Music Education" Preview the photos with students. Then have students read the text silently to themselves.
- Use the discussion questions or some of your own questions to engage students in discussing the topic and sharing their thoughts, opinions, and experiences.

Day	Pages/Resources	Time	Notes
2	Workbook pages 10 and 11	90–120 minutes	Gather the materials students need for the project.

Tasks

- Page 10: "Make a Song Storyboard" Guide students through reading the focus box and the project requirements.
- Page 12: Have students work independently to write their song and draw the pictures for it.
- Lastly, have students show their song storyboard to someone and sing their song.

Day	Pages/Resources	Time	Notes
3	Workbook pages 13 and 14	30 minutes	Bring in sheet music as a reference for students.

Tasks

- Page 13: "Pitch Perfect" Read the focus box to students. Then have them re-read it silently on their own and complete the activity independently. After they finish, review the answers as a group.
- Page 14: "Feel the Beat!" Read the focus box to students. Then have them re-read it silently on their own and complete the activity independently. After they finish, review the answers as a group.

Day	Pages/Resources	Time	Notes
4	Workbook page 15	10 minutes 30 minutes	In advance of the lesson, read the field trip suggestions on page 14 of this guide.

Tasks

- Page 15: "Sound Engineers" Have students read the directions and complete the items independently.
- Use the suggestions on page 14 of this guide to take students on a field trip or a virtual field trip to a music program at a school.

Day	Pages/Resources	Time	Notes
5, 6, 7	Workbook pages 16, 17, 18, and 19	60-minute sessions for 2–3 days	Have students gather materials for the STEAM task.

Tasks

- Page 16: "Problem to Solve" Have students read the problem and task and then discuss it as a group.
- Page 17: "Research for Your Presentation" Have students complete the items and conduct their research independently.
- Page 18: "Draft a Speech" Have students complete the brainstorm and design activity independently.
- Page 19: "Presentation to the School Board" Have students create their presentation and perform it in front of family and friends. Then have them complete the items on page 19.

Pacing Template

Unit: _____

Day	Pages/Resources	Time	Notes

Tasks

Day	Pages/Resources	Time	Notes

Tasks

Day	Pages/Resources	Time	Notes

Tasks

STEAM Rubric

Name: _____

Unit: _____

	Needs Guidance	Proficient	Notes
Student understands the problem			
Student provides solutions to the problem			
Student relates the problem to his or her own life			
Student empathizes			
Student understands science concept on Science Connection page			
Student demonstrates math skills on Math Connection page			
Student identifies technological items on Technology Connection page			
Student shows creativity when completing art projects			
Student understands how the occupation highlighted on the Career Spotlight page helps with the problem			

KWLF Graphic Organizer

Name: _____

Topic: _____

K What I know

W What I want to know

L What I learned

F How I feel

Design Process

Name: _____

What is the problem?

How can I help?

What I made.

What I will do next time.

Organization of Each Unit

Each unit in *Skill Sharpeners: STEAM* focuses on a real-world problem and features a realistic fiction text, a nonfiction text, an art project, and a variety of activities that focus on science, technology, engineering, and math. In addition, each unit includes a career connection that features real-world jobs. Following is a description of each component of the unit and the role it plays and its value for students.

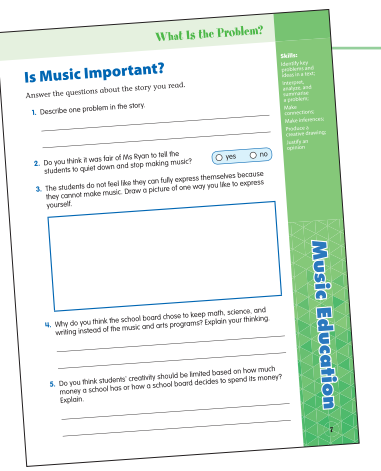
Real-World Connection

Each unit begins with a Real-World Connection text that focuses on the topic through a one-page realistic fiction story. The story provides context for students to understand the problem and possibly empathize with the people or animals that this problem affects. The story often includes multiple problems connected to the topic. Some problems are First World, such as inclusive playgrounds, and some are Third World, such as clean drinking water.



What Is the Problem?

The What Is the Problem? page follows the Real-World Connection story, and it focuses on having students identify one or more problems in the story. The items in this activity will help students think about the problem or problems that were presented and identify possible solutions from the story or from his or her own thoughts.



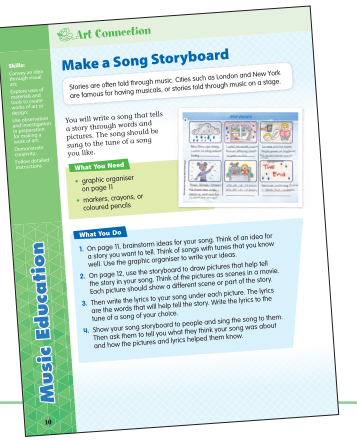
Learn About the Problem

Each unit includes a nonfiction text that provides students with more detailed information about the problem in the real world. Meaningful photos and illustrations provide context and enrich students' understanding of the problem.



Art Connection

Each unit includes an art connection that incorporates creativity into finding solutions. These activities provide an opportunity to be creative and to learn about how to relate topics to art and present information in an engaging way.



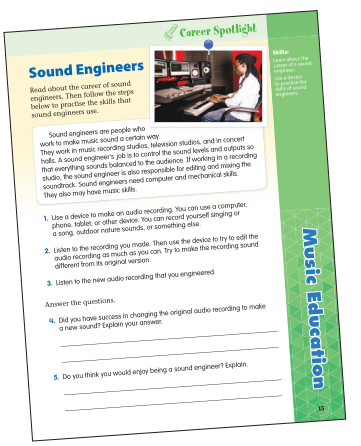
Science, Technology, Engineering, and Math Connections

The science, technology, and engineering connections present additional information about how these emphases are used to solve problems. The math connection activities relate the problems to a variety of real-world situations in which math concepts can be used to figure out solutions.



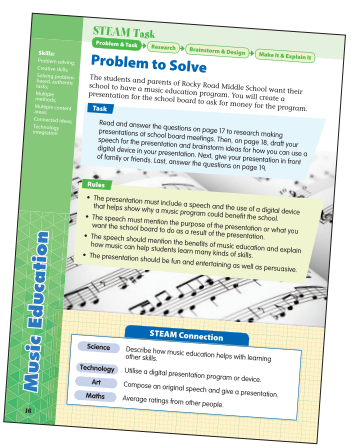
Career Spotlight

The career spotlight activities present a variety of careers related to the problems or solutions in the unit. These activities provide students with a real-world view of science, technology, engineering, arts, and math jobs and careers.



STEAM Task

Each unit culminates with a STEAM task. The STEAM task gives students a real-world scenario and a problem to solve using the following design process: Problem & Task, Research, Brainstorm & Design, Make It & Explain It. Students present their finished project, product, video, or other creation to an authentic audience.

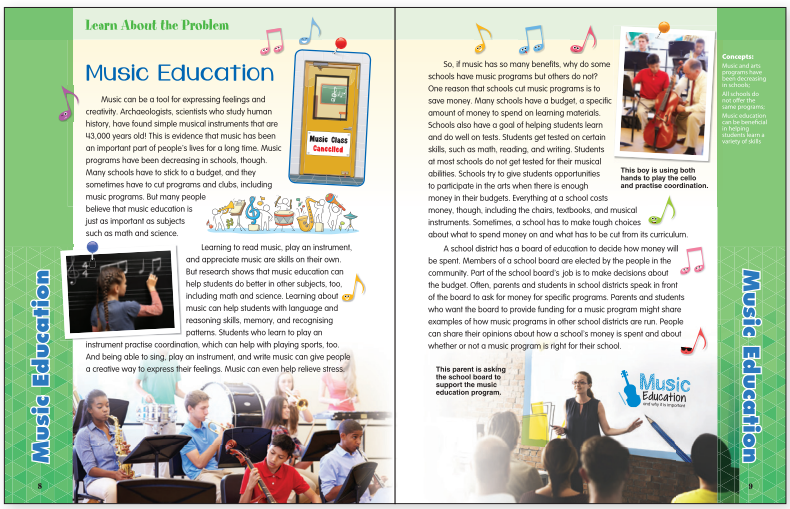


Music Education

Discussion Questions

Discussion questions for "Music Education," pages 8 and 9

After students read "Music Education," use the following questions along with some of your own to encourage discussion and to deepen students' understanding of the topic.



Do you play an instrument, or does someone in your family? Tell about it.

Does your school have a music program? Do you think it is important? If your school does not have a music program, do you think it should? Explain your opinion.

Do you think schools should test students in a music program for their musical abilities? Why or why not?

Can you empathize with schools that need to cut their funding for music programs? Why or why not?

Field Trip Suggestions

If you live near a school that has a music program, you might consider organizing a field trip to visit it. Have students notice the instruments that students are using, the environment the program takes place in, and how the instruction is taking place.

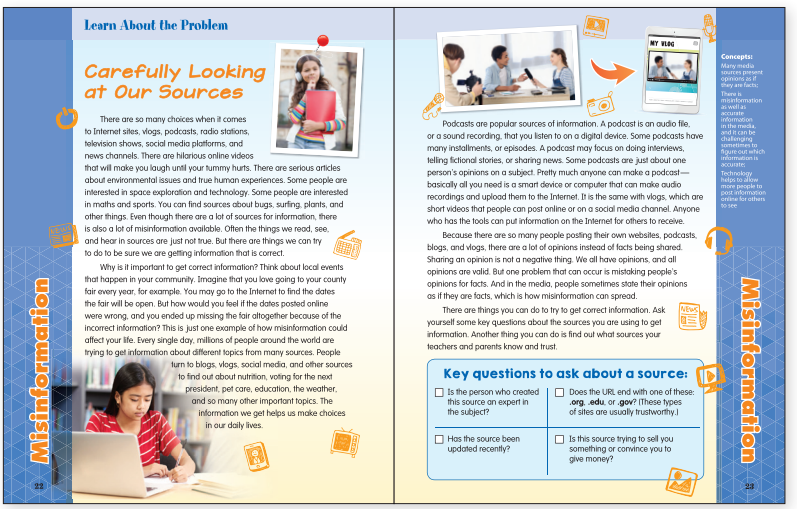
If you do not live near a school with a music program, consider taking a virtual field trip to see an orchestra. For example, the New York Philharmonic has virtual field trips for students. While this is not a music education program, it does allow students to experience the power of music through an orchestra. After the concert, have students talk about how they felt as they listened to the music and saw all the instruments that created it.



Discussion Questions

Discussion questions for "Carefully Looking at Our Sources," pages 22 and 23

After students read "Carefully Looking at Our Sources," use the following questions along with some of your own to encourage discussion and to deepen students' understanding of the topic.



What sources do you use to get information for your schoolwork? Why do you choose these sources?

What sources of information do you use to get information about sports or entertainment? Why do you choose these sources?

Do you agree that because of social media, there are a lot of opinions instead of facts being shared? Explain your opinion.



Repurpose Items

Discussion Questions

Discussion questions for "Repurposing Items," pages 36 and 37

After students read "Repurposing Items," use the following questions along with some of your own to encourage discussion and to deepen students' understanding of the topic.



Do you repurpose items? Describe what you repurposed and how you use it now.

Do you believe that repurposing items will help the environment? Explain your opinion.

Do you think that people who have the money to buy new things should try to use repurposed items instead? Explain your opinion.

Literature Suggestions

Consider reading students these stories about reusing items.

What Can You Do with Only One Shoe? Reuse, Recycle, Reinvent, written by Simon Shapiro and Sheryl Shapiro

Nature Recycles: How About You? written by Michelle Lord

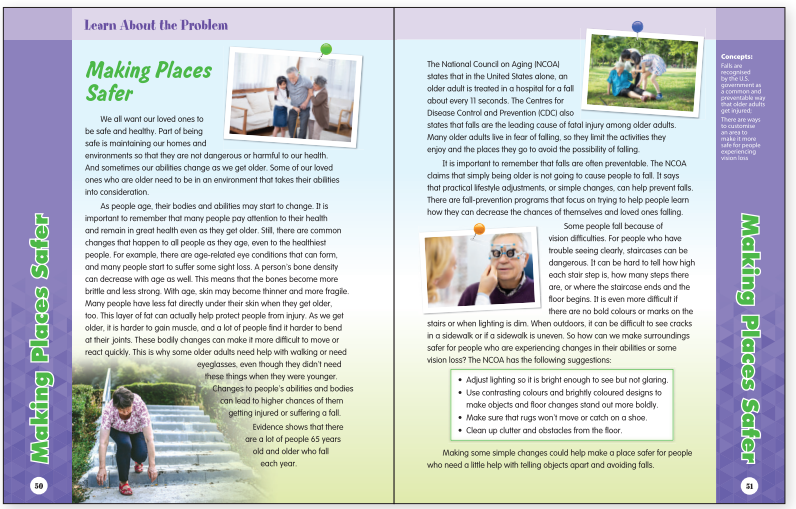


Making Places Safer

Discussion Questions

Discussion questions for "Making Places Safer," pages 50 and 51

After students read "Making Places Safer," use the following questions along with some of your own to encourage discussion and to deepen students' understanding of the topic.



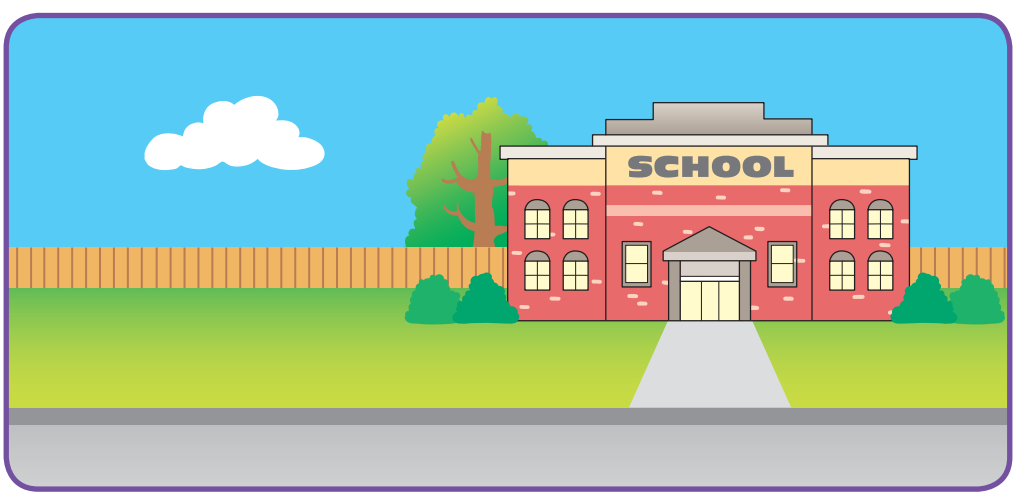
Do you know someone who is 65 or older and has injured themselves at home? Tell what happened.

Do you agree that simple changes such as clearing a path of clutter can help prevent falls? Explain your opinion.

Is there an area at your home that you think could be made safer by making simple changes? Tell about it.

Field Trip Suggestion

Visit an environment such as a school or community building and have students take note of areas that they feel can be made safer. Discuss their notes before you leave and consider sharing your suggestions with the building administrator.

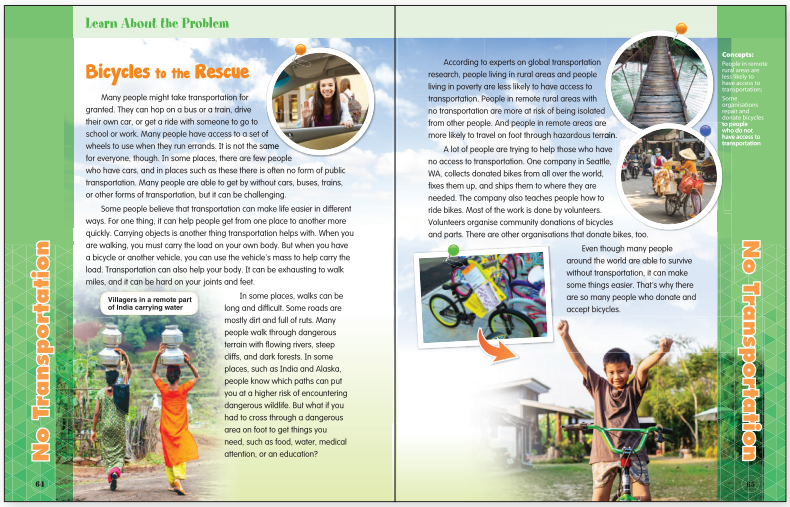


No Transportation

Discussion Questions

Discussion questions for "Bicycles to the Rescue," pages 64 and 65

After students read "Bicycles to the Rescue," use the following questions along with some of your own to encourage discussion and to deepen students' understanding of the topic.



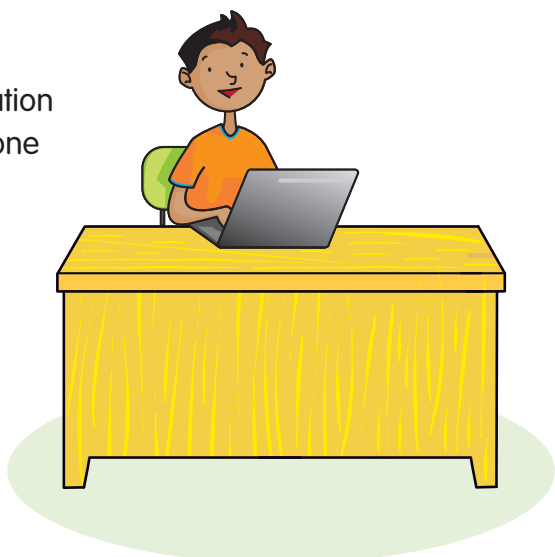
What form of transportation do you and your family use to get around?

Do you think donating bikes to people who don't have transportation makes a difference in their lives? Explain your opinion.

Do you empathize with people who have to walk long distances to meet their basic needs because they do not have access to transportation? Why or why not?

Virtual Field Trip Suggestion

Consider taking a virtual field trip to a bike donation organization such as WorkingBikes.org. Many organizations such as this one have videos on their website that explain what they do, how they do it, and who benefits from it. After the field trip, have students discuss what they saw, what they think it means, and how they feel.

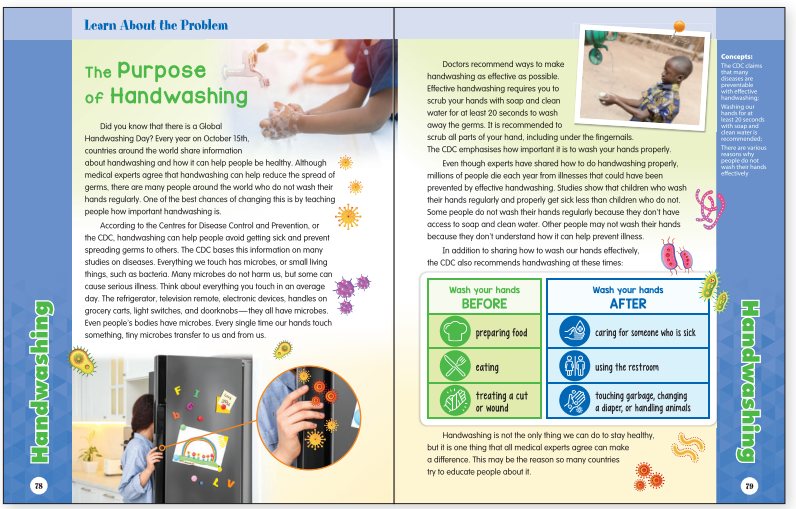


Handwashing

Discussion Questions

Discussion questions for "The Purpose of Handwashing," pages 78 and 79

After students read "The Purpose of Handwashing," use the following questions along with some of your own to encourage discussion and to deepen students' understanding of the topic.



Did you know prior to reading the text that everything we touch has microbes? If so, where did you learn this information?

Do you consider handwashing to be an important part of your daily routine? Explain why or why not.

Do you empathize with people who cannot wash their hands regularly because they don't have access to soap and clean water? Why or why not?

Literature Suggestions

Consider having students read these stories about germs to younger students from another class.

A Germ's Journey, written by Thom Rooke, M.D.

Germs vs. Soap, written by Didi Dragon and Hannah Robinett

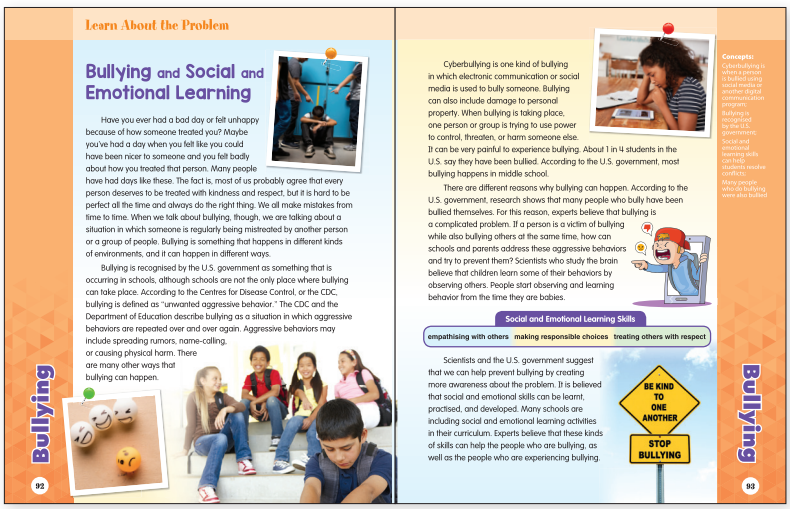


Bullying

Discussion Questions

Discussion questions for "Bullying and Social and Emotional Learning," pages 92 and 93

After students read "Bullying and Social and Emotional Learning," use the following questions along with some of your own to encourage discussion and to deepen students' understanding of the topic.



Have you been bullied at school, or do you know someone who has been bullied at school? How did you feel when it happened, and what did you do?

Have you been cyberbullied, or do you know someone who has been cyberbullied? Where and how did it happen?

Is social and emotional learning part of the curriculum at your school? Do you feel it should be? Why or why not?

Literature Suggestion

Consider reading students this book about one person's experience with bullying.

The Survival Guide to Bullying, written by Aija Mayrock

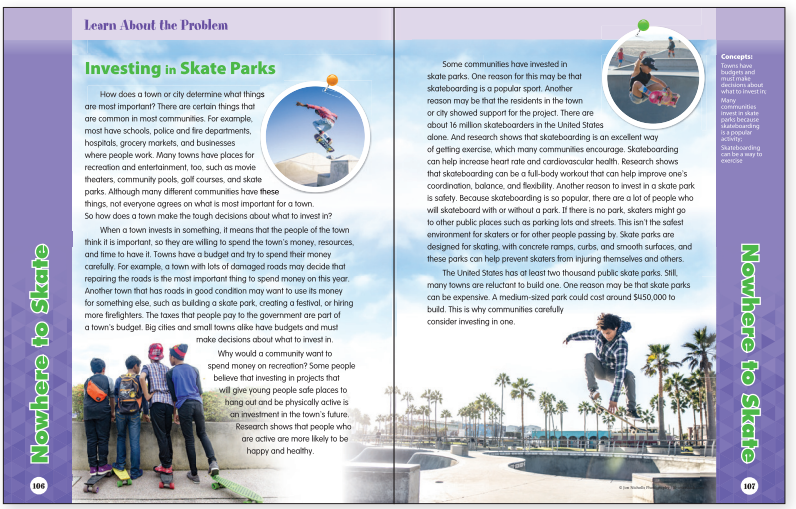


Nowhere to Skate

Discussion Questions

Discussion questions for "Investing in Skate Parks," pages 106 and 107

After students read "Investing in Skate Parks," use the following questions along with some of your own to encourage discussion and to deepen students' understanding of the topic.



Do you skateboard? Does your town have a skate park? In your opinion, should your town have a skate park? Why or why not?

How important do you think it is for a community to invest money in recreational spaces? Explain your opinion.

Considering where you live and the population, in your opinion, what would be the best recreational investment for your town to make?

Field Trip Suggestions

If you live near a skate park, you might consider organizing a field trip to visit it. Have students notice who is there, how they are using the park, and if they are observing the park rules.

If you do not live near a skate park, consider taking a virtual field trip to visit one. There are many virtual tours you can take to see skaters in action. Have students notice who is there, how they are using the park, and if they are observing the park rules.

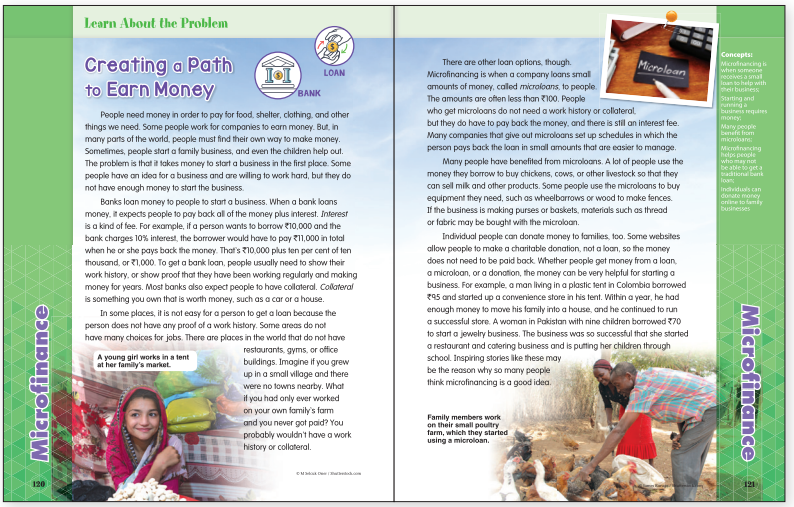


Microfinance

Discussion Questions

Discussion questions for "Creating a Path to Earn Money," pages 120 and 121

After students read "Creating a Path to Earn Money," use the following questions along with some of your own to encourage discussion and to deepen students' understanding of the topic.



Before reading the text, had you ever heard of microloans? If so, where did you learn about them?

Do you believe that microloans can change people's lives? Explain your opinion.

How would you describe microfinance and a microloan to someone?

Virtual Field Trip Suggestion

Consider taking a virtual field trip to see microloans in action. There are many videos posted online that show and tell the stories of people who are using microloans to start small businesses. Have students notice who is using the loans, what kind of work they do, and what environment their businesses are in. After the field trip, have students discuss what they saw, what they think it means, and how they feel.





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