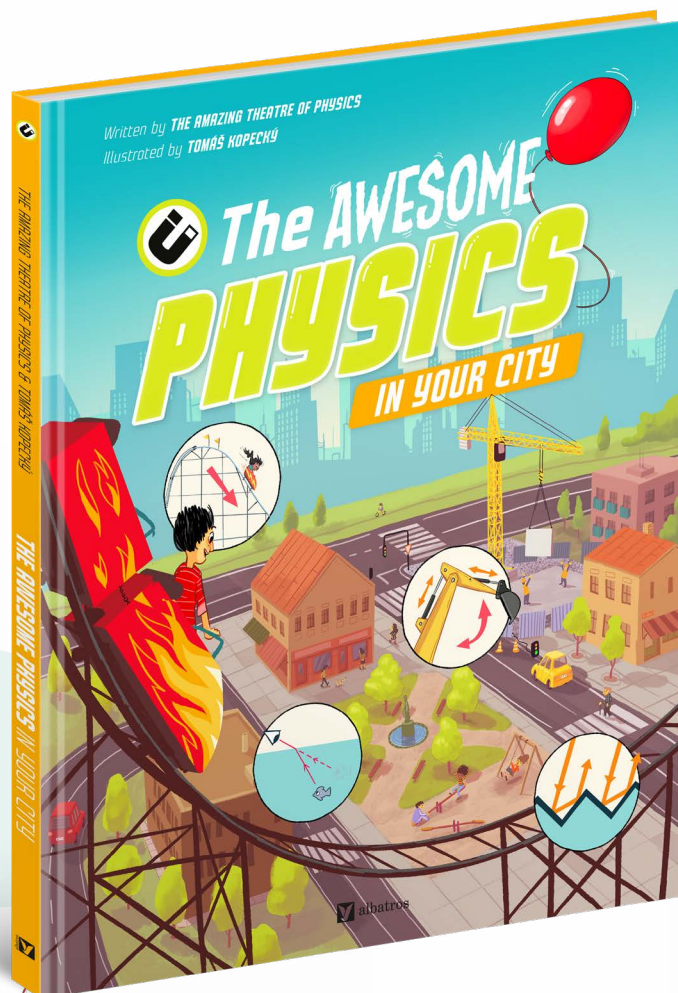




albatros

THE AWESOME PHYSICS IN YOUR CITY

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GUIDE FOR TEACHERS

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Curriculum: Forces and Interactions; Engineered Design; Energy;
Science, Technology, and Innovation

● AGES 9-12

● GRADES 4-7

● LEXILE LEVEL: 880L

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BEFORE READING

Essential Questions

1. What is physics?
2. Where do we see physics in our city?
3. How does physics help us to stay safe in our city?
4. What are some common physics tools and how are they used?
5. How does science make our lives better?

Discussion Questions

Physics is the study of matter, energy, and how they interact. It is a field of science that helps us understand how the universe works. According to the blurb, science is all around us. Is this true? Where do you see science around you now?

Look at the cover of the book. What kind of text do you think you will be reading? Is this a fiction or nonfiction text? How do you know?

Do you live in a rural, urban, or suburban community?
Does this place look like where you live?

According to the table of contents, where are the different places you can find physics?

What is a glossary? How might a glossary help you understand the text better?



DURING READING

Keep track of some funny moments that can be seen in each place in the city.

How does the illustrator use humor to engage the reader?

Energy is the power to make things happen. It can take on many forms.

Below are three main types of energy. Use the graphic organizer below to keep track of the different types of energy that the author describes in this text.



Examples:

Light energy - sunlight, candles, and light bulbs.

Sound energy - music, voices, and alarms.

Heat energy - fire, stoves, and heaters.

light	sound	heat

DURING READING

Discussion Questions

- *Was there anything interesting you saw the last time you were walking down the street in your neighborhood?*
- *Have you ever been on a tram in your city or in another city?*
- *Why are sewers, pipes, and cables mostly hidden underground?*
- *What is the Doppler effect?*
- *What does the author suggest about staying safe on the street in the dark? What about in rainy or snowy weather?*
- *Name some important safety gear to wear on your body when you're on a construction site.*
- *Why do construction vehicles move slowly?*
- *How are diggers similar to our bodies?*
- *What are some ways that a pulley might be helpful in your own life?*
- *How does using a slope make work less difficult?*
- *What other tools help with doing work more efficiently on a construction site?*
- *Where can physics be found in an amusement park?*
- *Explain what the author taught you about speed, gravity, electrons, and force.*
- *What gets things moving in an amusement park?*
- *What is inertia?*
- *Where is your favorite restaurant?*
- *Describe the science in making liquids hot or cold.*
- *What is density?*
- *What tools are helpful in a playground?*
- *What happens when you're in the middle of a merry-go-round and what happens when you're farther out?*
- *Explain what the author means by "slow going up, quick coming down"*
- *How should you dress for a slide?*
- *Do you know how to play any of the musical instruments described in the text?*

DURING READING

- *How are these instruments all similar or different?*
- *What is sound?*
- *What is buoyancy?*
- *Why do we get cold when we get out of the water?*
- *How do sound and light behave differently under the water?*
- *How is the sun both helpful and harmful for our bodies?*
- *What do you notice in the illustration provided in the section, "The energy of light?"*
- *Where can physics be found in a sports field?*
- *Which of these sports have you played before?*
- *Why is producing the right ball for sports such a challenge?*
- *What tools does a doctor use and how do they work?*
- *Explain how a microscope works.*
- *Who might use a microscope?*
- *How might a doctor see what's hidden inside our bodies?*
- *What is an ultrasound and how does it work?*
- *Is there anything surprising you learned about X-rays?*
- *Where do you see barcodes and QR codes in your daily life?*
- *Why do shops use security tags on their merchandise?*
- *How does a conveyor belt know when to stop?*
- *Why is it important to have a standard unit of measurement where the results are the same everywhere?*
- *What are the features of banknotes that make it difficult to forge?*



AFTER READING

Discussion Questions

Was there anything that was surprising to you?

What questions do you still have about physics?

Which experiment would you like to try?

Now that you've read the text and learned about physics, go back to look more closely at the illustrations for each section. Is there anything you're noticing now?

Vocabulary

Use pictures or words to show what each vocabulary word means.

Use the glossary and what you've learned from the text to describe each vocabulary term.



word

word

word

word

word

word

AFTER READING

Summarize

The mark of a good reader is being able to summarize a text. Summarizing text is expressing the most important facts of ideas about something in a short and clear form. Go back to the text and reread one of the sections you learned about. Write a summary for the information that you read.

Example:

How much can a wall bear?

The bricks we use to build houses are often riddled with holes. Inside them are hollow tubes filled with air, which help to trap heat inside the house. Most importantly, a brick must be sturdy, as the bottom row of masonry bears the weight of everything above it. So, even a brick with cavities in it can support a hefty load from top to bottom. But if you were to lay it on its side, the brick wouldn't support your weight without breaking. However, that doesn't matter, as the bricks in a wall only experience pressure from the top down, never from the sides. So, as long as you put them in the wall the right way, it's totally safe!

How much can a wall bear?

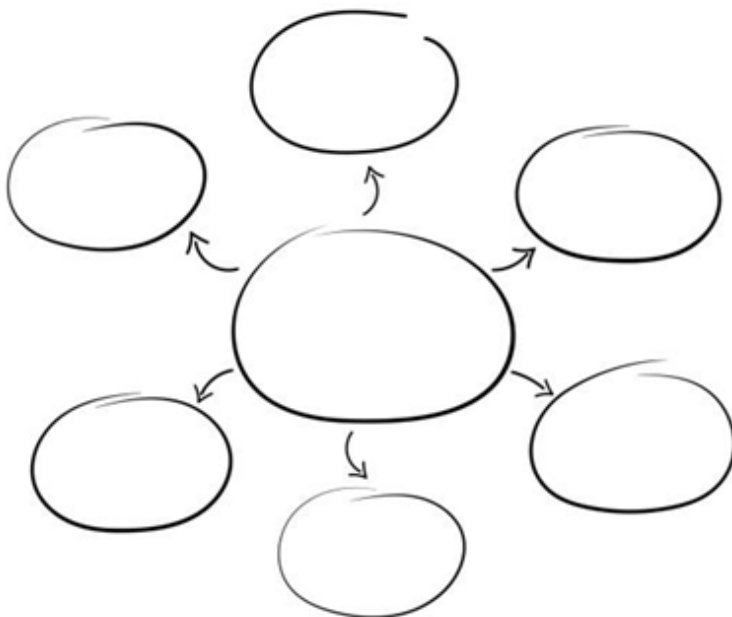
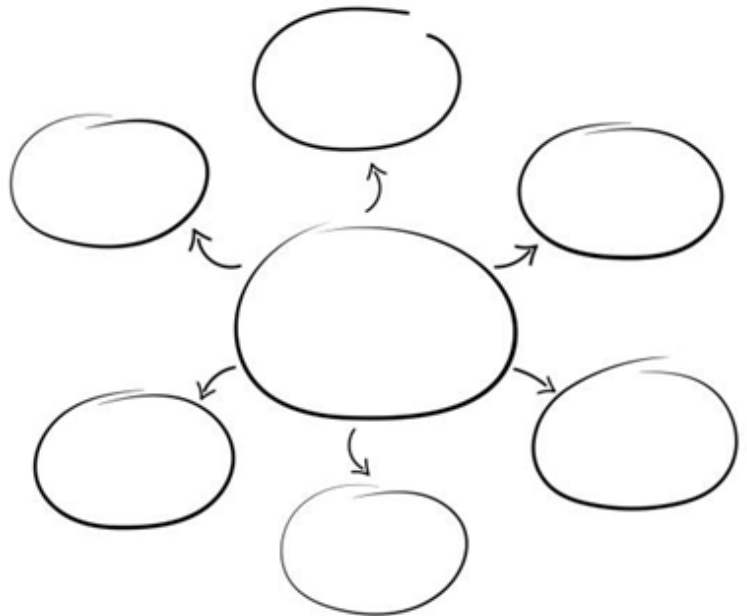
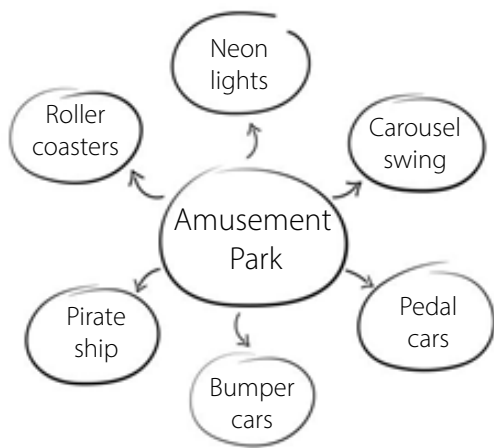
Houses are built with sturdy and hollow bricks that are filled with air that traps the heat inside the house. These bricks are strong enough to support heavy loads despite these gaps. The bottom row of bricks must be able to support the weight above it, so they must be laid the right way.

AFTER READING

Making Connections

There is awesome physics all around! Use what you've learned about physics to look around your classroom and school community. Where can you find physics in your classroom? In the lunchroom? The gym? Fill out the bubble maps below for two different places.

Example:



AFTER READING

Awesome Physics in Your School

Using what you've learned about physics and what you know about your surroundings when you are in school, create an extension of the book you just read!

Use text features such as illustrations and text boxes to describe where physics can be seen in your classroom or school.