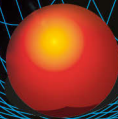




PATTERNS OF MOTION

$E=mc^2$
 $E=mc^2$
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 $E=mc^2$



EMILY SCHLESINGER



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ZOOM

You are sitting on the front porch. The night is quiet and dark. No one passes by. The street is empty, and you are bored. Then a question pops into your head. What keeps Earth in **motion**?

Suddenly, your body rises. You look down, speechless. The neighborhood is getting smaller. Soon you see the curve of the Earth. The Sun appears over this curve. Earth spins toward the Sun at full speed. This is 1,000 miles per hour (mph).

Zooming through space, you nearly crash into the Moon. It travels at over 2,000 mph. Getting away from Earth is tough. Rocks are everywhere. Over 30,000 surround Earth alone.

The journey goes on. You float by other planets. Next you must cross the Kuiper Belt. This is a highway of ice and gas. There is dust here too. It is made up of lost bits of Sun. They fly by at one million miles per hour.



Objects in the Kuiper Belt



Time passes. Then you see a giant cloud. Big chunks of ice and rock are inside it. This is at the edge of our **solar system**. It ends at last. You pause to get a better view. What you see is surprising. The Sun is racing away. It moves fast. Planets are going with it. They speed by at almost 500,000 mph. But where are they going? The planets circle the Milky Way. This is a **galaxy**.

⚡
Fast Fact

Speed is relative. This means it is measured in relation to a reference point. If you are flying in a plane, your speed is 0 mph relative to the seat. But your speed is 500 mph relative to the ground.



There is more to see. You zoom out again. Another surprise awaits. The galaxy is moving too. It is rushing away at over one million mph. But where is it going? It is not alone. There are 100 billion other galaxies around it. They are also racing apart. You are in awe. Then you realize. Space itself is growing. It is shooting outward.

You thought the night was quiet. But it is not. The Earth is never still. It is on a fast and furious path. Scientists are trying to find out where it is headed. They are learning new details all the time. Space is big. It is a mystery. **Forces** work in surprising ways. All of this affects the motion of Earth. It is taking us on a wild ride.



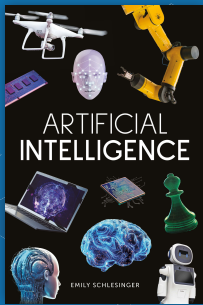
Fast Fact

Light travels at a speed of 186,000 miles per second.

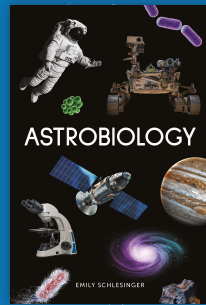


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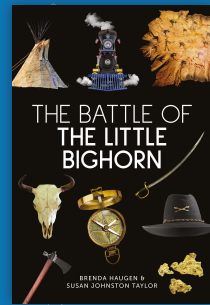
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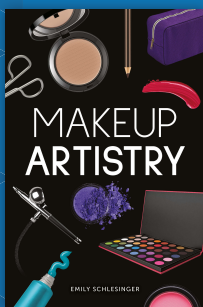
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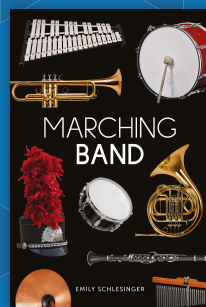
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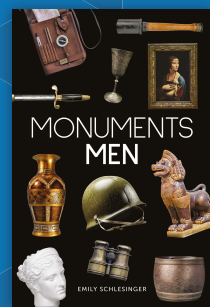
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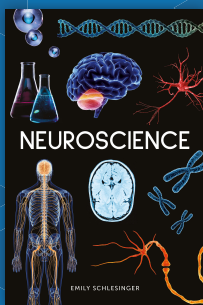
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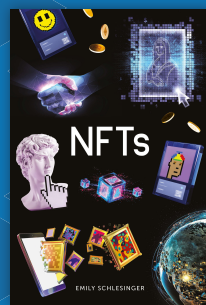
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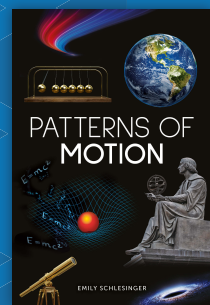
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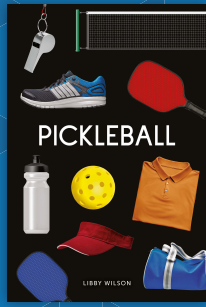
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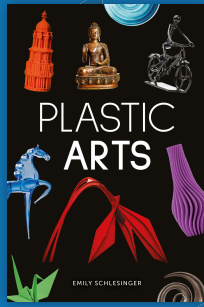
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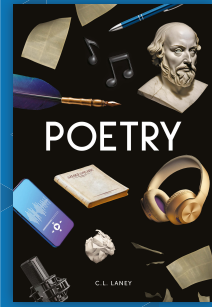
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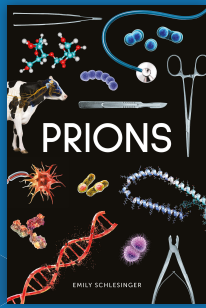
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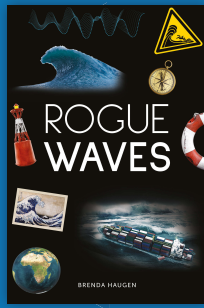
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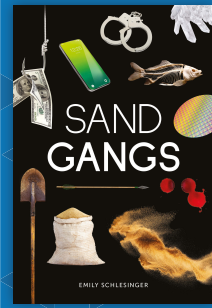
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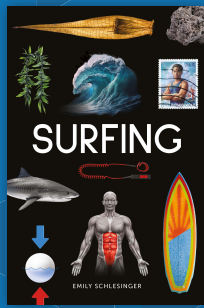
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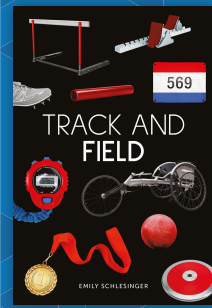
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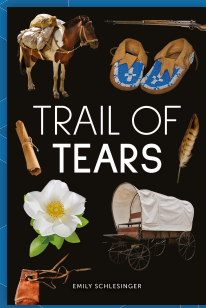
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SCIENCE

PATTERNS OF MOTION

Are you sitting still? You might think so, but you're not. Earth travels through space at 500,000 miles per hour. But it is not alone. Everything—stars, planets, even chunky balls of ice—is in motion. Why do we move? Where are we headed? Scientists have made fascinating discoveries and continue to search for more answers.



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