شكراً لتحميلك هذا الملف من موقع المناهج الإماراتية

حل كتاب الطالب من الصفحة 16 حتى 41

تاريخ نشر الملف على موقع المناهج: 2023-10-21 04:56:44

التواصل الاجتماعي بحسب الصف الثالث

روابط مواد الصف الثالث على تلغرام

التربية الاسلامية	اللغة العربية	اللغة الانجليزية	الرياضيات

المزيد من الملفات بحسب الصف الثالث والمادة علوم في الفصل الأول

1	أوراق عمل الكائنات الحية واحتياجاتها والنباتات وأجزاؤها والحيوانات وأعضاؤها متنوعة بالحل
2	ملخص درس خصائص الكائنات الحية من الوحدة الثانية
3	حل كتاب الطالب من الصفحة 16 حتى 41
4	مراجعة درس الكهرباء والمغناطيسية Electricity and Magnetism الإجابات مع
5	مراجعة درس القوى والحركة motion and Forces مع الإجابات


LESSON 1
Motion
6 ENGAGE Module: Forces and Motion

INQUIRY ACTIVITY

Hands On

Movement of a Wind-Up Toy

Materials

You have learned that you can measure the space between an object's starting position and its new position. Now let's look at the distance an object, such as a wind-up toy, travels in a given amount of time.

Make a Prediction How far will the wind-up toy travel in 10 seconds? How far will it travel in 20 seconds? Record your prediction in centimeters.

: The wind-up toy will move 7 centimeters in 10 seconds and 15 centimeters in 20 seconds.

Carry Out an Investigation

1. Place a piece of tape on your desk. This is the starting line.
2. Wind up the toy and place it at the starting line. Be sure to wind up the toy all the way. Get your stopwatch ready.
3. **Record Data** As you release the toy, start the timer. Stop the toy after 10 seconds, and mark the spot with tape. Use a meterstick to measure how far the toy went.
4. Repeat two more times, and write the distance the toy traveled for each trial.
5. Repeat this activity, but this time, stop the toy after 20 seconds.

	Trial 1	Trial 2	Trial 3
Distance Traveled in 10 seconds	9 cm	10 cm	10 cm
Distance Traveled in 20 seconds	15 cm	12 cm	14 cm

Communicate Information

6. Do your findings support your prediction? Explain.

Yes. The wind-up toy moved farther in 20 seconds than it did in 10 seconds.

7. Look at the data you collected. Compare the distance the toy traveled in 10 seconds and 20 seconds. What patterns do you notice?

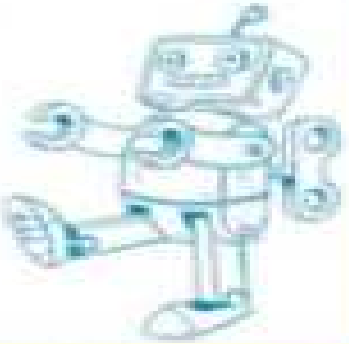
The toy moved farther the longer it was timed.

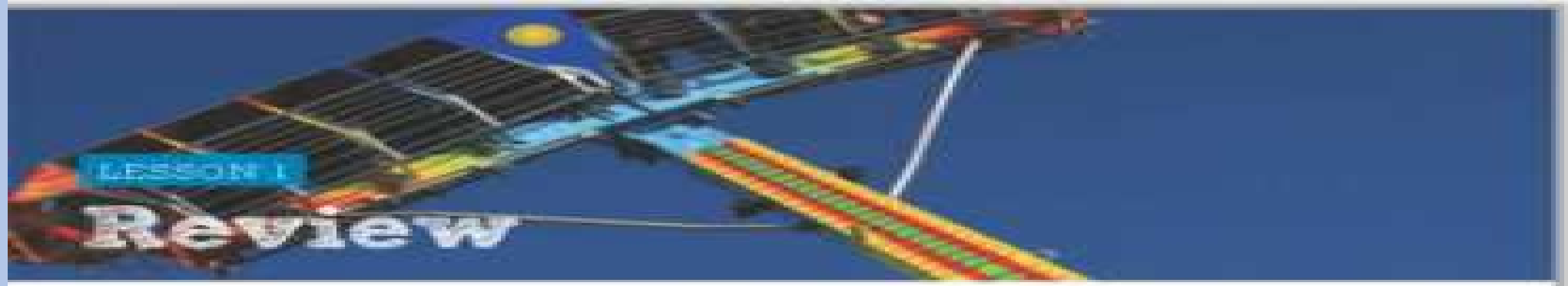
8. How far do you think the wind-up toy will travel in 25 seconds? Explain your reasoning.

I think the toy will move farther in 25 seconds.

Talk About It

You used a meterstick and stopwatch to measure distance and time during the activity. Discuss other tools and strategies you can use to measure the motion of the toy.





LESSON 1

Review

EXPLAIN THE PHENOMENON

Why does the ride move like that?

Summarize It

Explain patterns in motion. How can you measure the patterns of motion? What patterns in motion can you observe and measure in your classroom?

I can measure patterns in motion by determining an object's speed, distance, or direction. I can observe the hands of a clock moving around, a door swinging open and closed, and my teacher's arm erasing the white board.

REVISIT

Revisit the Page Keeley Science Probe on page 5. Has your thinking changed? If so, explain how it has changed.

Three-Dimensional Thinking

1. A ball is moving in a zigzag pattern, but you need it to go straight to reach the goal. How do you change the ball's motion?

   A. I leave it alone. It will go straight when I want it to.

   (B) I have to push the ball in a straight line to make it reach the goal.

   C. I have to pull the ball toward me and bounce it on the ground toward the goal.

2. The data below shows the distance a toy car traveled down three different ramps.

	Ramp 1	Ramp 2	Ramp 3
Distance Traveled in 20 seconds	4 cm	12 cm	5 cm

Which ramp is most likely the tallest? Explain how you know.

Ramp 2 is most likely the tallest. A car released from the highest ramp will have the most energy and travel the farthest.

3. Two objects start at the same location and travel at the same speed for one minute, but they end up in different locations. How did their motions differ?

They traveled in different directions.

Extend It

You are a principal of a school and need to have the gym set up for a magic show. Use direction, position, and distance to describe your gym setup. Once completed, give your plan to a classmate to draw your setup on a separate sheet of paper. Explain the outcome below.

: Students' instructions should include directions that will assist in creating the actual setup of the magic show.

OPEN INQUIRY

What questions do you still have?

Plan and carry out an investigation to answer one of your questions.

KEEP PLANNING

STEM Module Project
Engineering Challenge

Now that you have learned about position and motion, go to your Module Project to explain how the information will help you build your skatepark.

PAGE KEELEY SCIENCE PROBES

LESSON 2 LAUNCH

Golf Ball

Three friends are playing golf. They each have different ideas about the forces that act on a golf ball. This is what they think:

Finn: *Forces act on the golf ball only when the golfer hits the ball.*

Pete: *Forces act on the golf ball only when the ball is on the tee.*

Tad: *Forces act on the golf ball when it is on the tee and when the golfer hits the ball.*

Who has the best idea about forces? Tad

Explain why you think it is the best idea.

When the ball is at rest on the tee, two balanced forces are acting on it. Gravity pulls the ball toward Earth, and the tee exerts an equal upward force on the ball.

You will revisit the Page Keeley Science Probe later in the lesson.

ENCOUNTER
THE PHENOMENON

How are they going down the slide so fast?

GO ONLINE

Check out Slides to see the phenomenon in action.

Talk About It

Look at the photo and watch the video of the kids going down the slide. What questions do you have about the phenomenon? Talk about your questions and observations with a partner.

: What makes them go down so fast? What can they do to go down faster?

Did You Know?

London has the longest and tallest slide in the world. It takes about 40 seconds to go down!

INQUIRY ACTIVITY

Hands-On

Forces Affect the Way Objects Move

You saw people going down a slide. A slide is one kind of ramp. Investigate how the height of a ramp will change a toy car's motion.

Make a Prediction How will the height of a ramp affect the motion of a toy car?

: The car will move faster and farther when the ramp is taller.

Materials


4 books


cardboard


masking tape


toy car


meterstick

Carry Out an Investigation

1. Stack two books on the floor. Lean a piece of cardboard along the top book to make a ramp. Tape the edge of the cardboard to the floor.
2. Place a toy car at the top of the ramp. Release the car.
3. Connection Use the meterstick to measure the distance the car traveled.
4. **Record Data** Record the distance the car traveled in the data table.
5. Repeat steps 2–4 for a total of three trials.

6. Repeat steps 1–5 with a stack of four books.

	Distance Traveled in Centimeters		
	Trial 1	Trial 2	Trial 3
Two-book ramp	80 cm	103 cm	74 cm
Four-book ramp	235 cm	211 cm	185 cm

7. Compare the distances the toy car traveled with the two ramps. What pattern do you see?

In every trial, the distance the car traveled from the ramp with four books was greater than the distance it traveled from the ramp with two books.

8. Predict what would happen if your ramp had six books.

The car would move farther and faster.

INQUIRY ACTIVITY

Communicate Information

9. Did your observations support your prediction? Explain.

Yes, the car moved faster and farther when the ramp was taller.

10. Draw a real-world example of how the height of a ramp affects the motion of an object.

Drawings could show a cart rolling down a ramp, a truck going down a hill, or another real world example.

MAKE YOUR CLAIM

What makes a toy car slide down a ramp?

Make a claim. Use your investigation.

CLAIM

_____ cause a toy car to slide down a ramp.

Unbalanced forces

Cite evidence from the lesson.

EVIDENCE

The investigation showed that a toy car _____.

traveled 211 cm on the floor, 174 cm on sandpaper, and 72 cm on a cotton cloth

Discuss your reasoning as a class. Tell about your discussion.

REASONING

The evidence supports the claim because _____.

the pull of gravity on the moving toy is greater than the force of friction exerted in the opposite direction.

You will revisit your claim to add more evidence later in this lesson.

Changing Motion

GO ONLINE Explore the PhET simulation Forces and Motion to see the forces in tug of war.

Think back to your toy car. With a partner, brainstorm five ways you can make an object have motion. In the table, draw a picture using arrows to indicate direction. Label what force was applied and if the forces were balanced or unbalanced.

Motion	Forces Acting on Object	Balanced or Unbalanced
Make an object remain still	Place object on the floor	☑ Balanced ☐ Unbalanced
Make an object move forward	Pull from front	☐ Balanced ☑ Unbalanced
Make an object move faster, forward	Pull or push with greater force	☐ Balanced ☑ Unbalanced

Motion	Forces Acting on Object	Balanced or Unbalanced
Make an object move sideways	Push from one side or pull from one side	☐ Balanced ☑ Unbalanced
Make an object move up	Push up	☐ Balanced ☑ Unbalanced
Make an object move down	Push down	☐ Balanced ☑ Unbalanced

REVISIT Revisit the Page Keeley Science Probe on page 21.

Landscape Designers plan and design public spaces, residential areas, and college campuses. They are creative people who like to work on big projects. You might think landscape designers work only with plants and lawns, but they also know a lot about paving, walls, fencing, wood, concrete, and metal. They know about irrigation and water management, too.

Landscape designers also think a lot about motion and force. When they design spaces where people will work or play, they consider what objects will move through the spaces and the forces that will affect the movement of the objects.

It's Your Turn

As a landscape designer, what information would you need to build a skatepark? How could you find out how skateboarders move in a park, and how would your findings influence your design?

STEM Connection

What Does a Landscape Designer Do?

15 min small groups

Introduce the landscape designer STEM Connection.

ASK: Why would a park hire a landscape designer? A park would hire a landscape designer to ensure that plants, statues, playground equipment, and utilities are not interfering with each other.

ASK: Why does a landscape designer need to know about force and motion? A landscape designer needs to know how objects will move in certain spaces.

ASK: Give an example of why knowing about force or motion is important to a landscape designer. If the park requires a swing, the landscape designer must be aware of the motion of the swing and give it enough room.

It's Your Turn

At this point in the lesson, students can use what they have learned to make connections to what they will be doing in the STEM Module Project when they will design, build, and test a model of a skatepark.

INQUIRY ACTIVITY

Hands On

On the Move

When playing with toy cars, some cars are faster than others. With a push on the floor, the car starts out fast. It then slows down and stops. Investigate how different materials can affect the speed and distance of a toy car.

Make a Prediction What would happen if a toy car rolls over different materials?

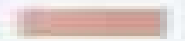
The more friction against an object, the faster the object stops.

Carry Out an Investigation

1. Make the four-book ramp. Copy the data from the "Four-book ramp" row of the table on page 25 into the "Floor" row of the table on page 37.
2. Tape a layer of sandpaper at the bottom of the cardboard ramp. Release the car from the top of the ramp.
3. **Record Data** Measure and record the distance the car travels. Repeat for a total of three trials.
4. Remove the sandpaper. Tape a cotton cloth to the floor at the bottom of the cardboard ramp. Release the car from the top of the ramp.
5. **Record Data** Measure and record the distance the car travels. Repeat for a total of three trials.

Materials


4 books


cardboard


masking tape


toy car


metersticks


sandpaper

cotton cloth

	Distance Traveled		
	Trial 1	Trial 2	Trial 3
Floor	211 cm	235 cm	185 cm
Sandpaper	174 cm	171 cm	180 cm
Cotton cloth	72 cm	76 cm	65 cm

Communicate Information

6. Why did the car slow down when traveling on a sandpaper surface?

The sandpaper caused more friction. This made the car slow down.

Talk About It

Compare your results with your classmates' results. What material would you use if you wanted an object to stop quickly? Why do you think some materials caused more friction than other materials?

COLLECT EVIDENCE

Add evidence to your claim on page 27 about how forces affect an object's motion.

EXPLAIN
THE PHENOMENON

How are they going down the slide so fast?

Summarize It

Explain the effects of a force acting on an unmoving object.

When you apply a force, such as a push or a pull, to an unmoving object, it causes the object to move.

REVISIT PAIGE KELLEY SCIENCE PROBES

Revisit the Paige Kelley Science Probe on page 21. Has your thinking changed? If so, explain how it has changed.

Three-Dimensional Thinking

1. How do forces change the motion of objects?

   A. Forces can change the speed or direction of an object's motion.

   B. The size of the force affects the speed of the object.

   C. The direction of the force affects the direction of the object's motion.

   (D) All the above

   E. None of the above

2. An egg is about to roll off the counter. How can you get the egg to stop without picking it up?

I have to apply a force in the opposite direction of the egg's motion.

3. Explain why the amount of friction would be different on an icy surface and a dry, concrete surface. How does the amount of friction affect the movement of an object across both surfaces?

The icy surface would have less friction than the concrete surface. An object would move faster and might travel farther if it was pushed across an icy surface than if it was pushed across a concrete surface because of the difference in the amount of friction.

Extend It

You are the mayor of San Francisco, California. The trolley cars are in need of repair. How might you communicate with your citizens about the importance of repairing the cable car brakes? Think about what you have learned in this module to help explain force and motion.

Write a speech, draw a poster, create a flyer, or use media.

All student work should show the use of vocabulary words and identify why cable car brakes should function correctly.

KEEP PLANNING

STEM Module Project
Engineering Challenge

Now that you have learned how forces can affect motion, go to your Module Project to explain how the information will affect your plan for the skatepark.