Name: _____ Date: _____

Why a Rolling Marble Finally Stops

Circle group

Roll a marble on the floor. It goes fast. Then it slows down. At last it stops. No one touched it. Why did it stop?

A moving thing keeps moving unless a force changes it. A force is a push or a pull. A force works against the marble. This force is friction.

Friction happens when two surfaces rub. Even a smooth floor has tiny bumps. The marble catches on them as it rolls. Each bump takes a bit of its motion. The air slows it a tiny bit too.

Try it on different floors. On a rug, the marble stops fast. The soft threads grab it. On a slick tile floor, it rolls far. On ice, it would roll even farther.

Friction can help. Your shoes grip the ground. You do not slip.

Questions

1. What is a force?

_____

_____

2. What is the force that stops the marble?

_____

_____

3. When does friction happen?

_____

_____

4. Why does the marble stop fast on a rug?

_____

_____

5. Why would a marble roll farther on ice than on a rug?

_____

_____

6. How does friction help your shoes?

_____

_____

Words to know

friction: a force that slows things as they rub together
force: a push or a pull on an object
surface: the outside or top of something
motion: the act of moving
slick: smooth and slippery

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Why a Rolling Marble Finally Stops

Triangle group

Roll a marble across the floor. It zips along, then slows down, and at last it stops. Nobody touched it. So why did it stop?

A moving object keeps moving unless a force changes its motion. A force is a push or a pull. The marble stops because a force is working against it. That force is called friction.

Friction happens when two surfaces rub together. Even a smooth floor has tiny bumps, and the marble catches on them a little as it rolls. Each bump takes away a bit of its motion. The marble also pushes through the air, and the air slows it a tiny bit too.

Try rolling the marble on different floors. On a rug, it stops quickly, because the soft threads grab it. On a slick tile floor, it rolls far. On ice, which is even smoother, a marble would roll farther still.

Friction can be helpful. Your shoes grip the ground because of it, and that keeps you from slipping.

Questions

1. What is a force?

_____

_____

2. What is the force that stops the marble called?

_____

_____

3. When does friction happen?

_____

_____

4. Why does the marble stop quickly on a rug?

_____

_____

5. Why would a marble roll farther on ice than on a rug?

_____

_____

6. How does friction help your shoes?

_____

_____

Words to know

friction: a force that slows things as they rub together
force: a push or a pull on an object
surface: the outside or top of something
motion: the act of moving
slick: smooth and slippery

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Why a Rolling Marble Finally Stops

Square group

Roll a marble across the floor and watch closely. It zips along at first, gradually slows down, and eventually comes to a complete stop. Nobody touched it along the way, so what made it stop?

A moving object will keep on moving unless some force changes its motion. A force is simply a push or a pull. The marble stops because a force is working against it, and that force is known as friction.

Friction occurs whenever two surfaces rub against each other. Even a smooth floor is covered in tiny bumps, and the marble catches on them slightly as it rolls. Each bump steals a little of its motion. The marble must also push its way through the air, and the air slows it by a very small amount as well.

Try rolling the marble across several different floors. On a rug, it stops almost immediately, because the soft threads grab hold of it. On a slick tile floor, it rolls a long way. On ice, which is smoother still, a marble would travel even farther.

Friction is often helpful. Thanks to it, the soles of your shoes grip the ground, and that keeps you from slipping.

Questions

1. What is a force?

_____

_____

2. What is the force that stops the marble known as?

_____

_____

3. When does friction occur?

_____

_____

4. Why does the marble stop almost immediately on a rug?

_____

_____

5. Why would a marble travel farther on ice than on a rug?

_____

_____

6. How does friction help the soles of your shoes?

_____

_____

Words to know

friction: a force that slows things as they rub together
force: a push or a pull on an object
surface: the outside or top of something
motion: the act of moving
slick: smooth and slippery

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

For the teacher: Why a Rolling Marble Finally Stops

Each student sheet carries a shape, not a level. The same topic and facts, written three ways.

Circle: Why a Rolling Marble Finally Stops

Easier · 134 words · Flesch-Kincaid grade 0.7

1. A push or a pull.
2. Friction.
3. When two surfaces rub.
4. The soft threads grab it.
5. Ice is very smooth, so there is less friction.
6. They grip the ground so you do not slip.

Triangle: Why a Rolling Marble Finally Stops

This passage · 166 words · Flesch-Kincaid grade 3.2

1. A push or a pull.
2. Friction.
3. When two surfaces rub together.
4. The soft threads grab it.
5. Ice is much smoother, so there is less friction to slow it.
6. It makes them grip the ground so you do not slip.

Square: Why a Rolling Marble Finally Stops

Harder · 198 words · Flesch-Kincaid grade 5.4

1. A push or a pull.
2. Friction.
3. Whenever two surfaces rub against each other.
4. The soft threads grab hold of it.
5. Ice is much smoother, so there is less friction to slow the marble.
6. It makes them grip the ground so you do not slip.