Name: _____ Date: _____

The Tiny Pins on a Music Box Drum

Circle group

Wind up a music box. Lift the lid. A tune tinkles out. There is no tiny band inside. The music comes from metal and a spinning drum.

Inside is a metal comb. Its teeth have different lengths. Short teeth make high notes. Long teeth make low notes. Each tooth is a thin strip of metal. When it is plucked, it vibrates. We hear the vibration as sound.

A cylinder covered with small pins does the plucking. A spring unwinds and turns the cylinder slowly. Each pin sticks out a little. When a pin passes a tooth, it flicks the tooth. A note rings out. Where the pin sits along the cylinder picks the note. How far apart the pins are around the cylinder picks when.

The cylinder is like a memory. The maker puts each pin in place to match a song. The cylinder turns the same way each time. So the song repeats the same way.

A music box shows how a machine can store a song. Player pianos used the same idea with paper rolls.

Questions

1. What makes the notes inside a music box?

_____

_____

2. Which teeth make the low notes?

_____

_____

3. What turns the cylinder?

_____

_____

4. What do the pins do to the teeth?

_____

_____

5. Why does a music box play the same song each time?

_____

_____

6. Why is the cylinder like a memory?

_____

_____

Words to know

vibrate: to shake back and forth very quickly
cylinder: a shape like a can or a tube
spring: a coil of metal that stores energy
tinkle: to make a light, ringing sound

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: _____

The Tiny Pins on a Music Box Drum

Triangle group

Wind up a small music box, lift the lid, and a tune begins to tinkle out. There is no tiny band inside. The music comes from a clever arrangement of metal and a spinning drum.

Inside the box is a metal comb. Its teeth are cut to different lengths. Short teeth make high notes, and long teeth make low ones. Each tooth is a thin strip of metal that vibrates when it is plucked, and a vibration is what we hear as sound.

The plucking is done by a cylinder covered with small pins. As a spring unwinds, it turns the cylinder slowly. Each pin sticks out a little, so when it passes a tooth of the comb, it flicks the tooth and a note rings out. The position of each pin along the cylinder decides which note it plays. The spacing around the cylinder decides when.

So the cylinder is really a kind of memory. The maker places every pin by hand or machine to match a song. When the cylinder turns the same way each time, it repeats the song exactly the same way.

A music box is a small example of how a machine can store instructions. Later machines, such as player pianos, used the same idea with paper rolls.

Questions

1. What is inside a music box that plays the notes?

_____

_____

2. Which teeth make the low notes?

_____

_____

3. What turns the cylinder as it unwinds?

_____

_____

4. What do the pins on the cylinder do to the teeth?

_____

_____

5. Why does a music box play the same song every time?

_____

_____

6. Why does the passage call the cylinder a kind of memory?

_____

_____

Words to know

vibrate: to shake back and forth very quickly
cylinder: a shape like a can or a tube
spring: a coil of metal that stores energy
arrangement: a way that parts are put in order
tinkle: to make a light, ringing sound

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: _____

The Tiny Pins on a Music Box Drum

Square group

Wind up a small music box and lift its lid, and a delicate tune begins to tinkle out. There is no miniature band hiding inside. The music comes from a clever arrangement of metal parts and a slowly spinning drum.

Within the box sits a metal comb whose teeth are cut to different lengths. Short teeth produce high notes, whereas long teeth produce low ones. Each tooth is a thin strip of metal that vibrates when it is plucked, and a vibration is exactly what we hear as sound.

The plucking is accomplished by a cylinder studded with small pins. As a spring gradually unwinds, it rotates the cylinder. Each pin protrudes slightly, so when it passes a tooth of the comb, it flicks the tooth and a note rings out. The position of each pin along the cylinder determines which note it plays, while the spacing around the cylinder determines when.

In this way, the cylinder serves as a kind of memory. The maker arranges every pin, by hand or by machine, to match a song. Because the cylinder turns identically each time, it repeats the song in precisely the same way.

A music box is a charming example of how a machine can store instructions. Later inventions, such as player pianos, used the same principle with rolls of paper.

Questions

1. What inside a music box produces the notes?

_____

_____

2. Which teeth produce the low notes?

_____

_____

3. What rotates the cylinder as it gradually unwinds?

_____

_____

4. What do the pins on the cylinder do to the teeth of the comb?

_____

_____

5. Why does a music box repeat the same song every time?

_____

_____

6. Why does the passage describe the cylinder as a kind of memory?

_____

_____

Words to know

vibrate: to shake back and forth very quickly
cylinder: a shape like a can or a tube
spring: a coil of metal that stores energy
arrangement: a way that parts are put in order
tinkle: to make a light, ringing sound

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: The Tiny Pins on a Music Box Drum

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

Circle: The Tiny Pins on a Music Box Drum

Easier · 177 words · Flesch-Kincaid grade 2

1. A metal comb with teeth of different lengths.
2. The long teeth.
3. A spring as it unwinds.
4. They flick the teeth so notes ring out.
5. The pins stay in the same places and the cylinder turns the same way.
6. It stores the song in where the pins are placed.

Triangle: The Tiny Pins on a Music Box Drum

This passage · 213 words · Flesch-Kincaid grade 4.9

1. A metal comb with teeth of different lengths.
2. The long teeth.
3. A spring.
4. They flick the teeth so that notes ring out.
5. The pins stay in the same places and the cylinder turns the same way.
6. It stores the song in the placement of its pins.

Square: The Tiny Pins on a Music Box Drum

Harder · 221 words · Flesch-Kincaid grade 7.1

1. A metal comb with teeth of different lengths.
2. The long teeth.
3. A spring.
4. They flick the teeth so that notes ring out.
5. The pins stay in the same positions and the cylinder turns the same way.
6. It stores the song in the arrangement of its pins.