Name: _____ Date: _____

How a Pulley Lifts a Load

Circle group

Say you need to lift a heavy bucket of sand to the top of a building. You could climb a ladder and carry it. But that is tiring and not safe. A better way is to use a pulley. A pulley is a simple machine that people have used for thousands of years.

A pulley is a wheel with a groove around its edge. A rope fits in the groove and slides over the wheel. Hang a pulley from a high beam and thread a rope through it. Tie the bucket to one end of the rope. Pull down on the other end. As you pull down, the bucket goes up. The pulley does not make the job lighter. It changes the direction of your pull. Pulling down is easier than lifting up, because you can use your own body weight.

You can make the job easier still with more than one pulley. In a system of several wheels, the rope loops around them. More sections of rope share the load. Each section carries only part of the weight. You must pull a longer length of rope. But you can lift something very heavy with much less force.

Pulleys are found in cranes, flagpoles, elevators, and window blinds. When you raise a flag or lift a blind, you are using this clever invention.

Questions

1. What is a pulley?

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2. What does a single pulley change about your pull?

_____

_____

3. Why is pulling down on a rope easier than lifting a load up?

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4. Why does a system of several pulleys make lifting easier?

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_____

5. Where are two places pulleys are used?

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_____

Words to know

pulley: a wheel with a rope that helps lift things
groove: a long, narrow channel cut into a surface
beam: a long, strong piece of wood or metal
direction: the way something moves or points
invention: something new that someone made

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: _____

How a Pulley Lifts a Load

Triangle group

Imagine you need to lift a heavy bucket of sand to the top of a building. You could climb a ladder and carry it, but that would be tiring and unsafe. A better way is to use a pulley, which is one of the simple machines that people have used for thousands of years.

A pulley is a wheel with a groove around its edge. A rope fits into the groove and slides over the wheel. If you hang a pulley from a high beam and thread a rope through it, you can tie the bucket to one end and pull down on the other end. As you pull down, the bucket goes up. The pulley does not make the job lighter, but it changes the direction of your pull. Pulling down is easier than lifting up, because you can use the weight of your own body.

You can make the job easier still by using more than one pulley. In a system of several wheels, the rope is wrapped around them in a loop. The load is shared by more sections of rope, so each section carries only part of the weight. You must pull a longer length of rope, but you can lift something very heavy with far less force.

Pulleys are found in cranes, flagpoles, elevators, and window blinds. Next time you raise a flag or lift a blind, you are using this clever invention.

Questions

1. What is a pulley?

_____

_____

2. What does a single pulley change about your pull?

_____

_____

3. Why is pulling down on a rope easier than lifting a load up?

_____

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4. Why does a system of several pulleys make lifting easier?

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_____

5. Where are two places pulleys are used?

_____

_____

Words to know

pulley: a wheel with a rope that helps lift things
groove: a long, narrow channel cut into a surface
beam: a long, strong piece of wood or metal
direction: the way something moves or points
invention: something new that someone made

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: _____

How a Pulley Lifts a Load

Square group

Suppose you needed to hoist a heavy bucket of sand to the top of a building. You could climb a ladder and carry it, but that would be exhausting and dangerous. A far better method is to use a pulley, which is one of the simple machines that people have relied on for thousands of years.

A pulley consists of a wheel with a groove around its edge, and a rope fits into the groove and slides over the wheel. If you suspend a pulley from a high beam and thread a rope through it, you can tie the bucket to one end and pull downward on the other. As you pull down, the bucket rises. The pulley does not make the job lighter, but it changes the direction of your pull. Pulling down is easier than lifting up, because you can take advantage of the weight of your own body.

You can make the job easier still by combining several pulleys. In a system of multiple wheels, the rope is wound around them in a loop. The load is distributed among additional sections of rope, so each section supports only part of the weight. You must pull a longer length of rope, but you can raise something extremely heavy with far less force.

Pulleys are found in cranes, flagpoles, elevators, and window blinds. Whenever you raise a flag or lift a blind, you are putting this clever invention to work.

Questions

1. What does a pulley consist of?

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2. What does a single pulley change about your pull?

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3. Why is pulling down on a rope easier than lifting a load upward?

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_____

4. Why does a system of multiple pulleys make lifting easier?

_____

_____

5. Where are two places pulleys are found?

_____

_____

Words to know

pulley: a wheel with a rope that helps lift things
groove: a long, narrow channel cut into a surface
beam: a long, strong piece of wood or metal
direction: the way something moves or points
invention: something new that someone made

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: How a Pulley Lifts a Load

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

Circle: How a Pulley Lifts a Load

Easier · 223 words · Flesch-Kincaid grade 3.2

1. A wheel with a groove around its edge that a rope slides over.
2. The direction of the pull.
3. You can use your own body weight.
4. More sections of rope share the load, so you need less force.
5. Cranes, flagpoles, elevators, or window blinds.

Triangle: How a Pulley Lifts a Load

This passage · 238 words · Flesch-Kincaid grade 5.4

1. A wheel with a groove around its edge that a rope slides over.
2. The direction of the pull.
3. You can use the weight of your own body.
4. The load is shared by more sections of rope, so you need less force.
5. Cranes, flagpoles, elevators, or window blinds.

Square: How a Pulley Lifts a Load

Harder · 241 words · Flesch-Kincaid grade 7.1

1. A wheel with a groove around its edge, with a rope that slides over it.
2. The direction of the pull.
3. You can take advantage of the weight of your own body.
4. The load is distributed among more sections of rope, so less force is needed.
5. Cranes, flagpoles, elevators, or window blinds.