Energy Stores and Transfers Worksheet
Teacher Notes

Two versions of the worksheet are provided.

KS3 Version

This version names the thermal energy store and is suitable for KS3 students and students studying Edexcel iGCSE.

KS4 Version

This version names the internal (thermal) energy store and is suitable for GCSE students. This will support students to link the thermal store they learnt about at KS3 with the new content at GCSE.

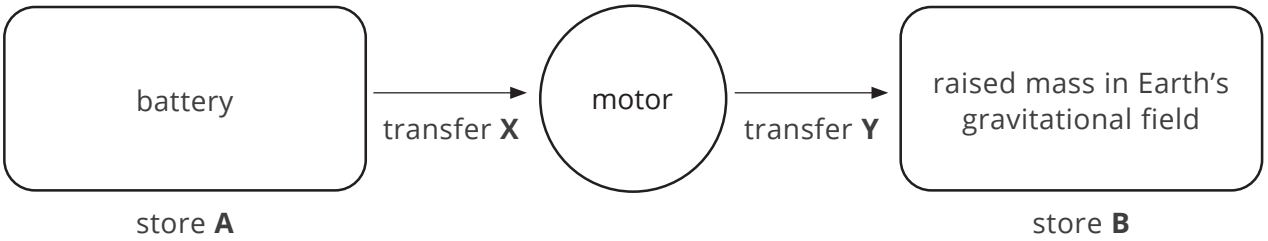
Energy Stores and Transfers **Answers**

1. List all the ways that energy is stored in the picture.
   - **nuclear in the power station**
   - **gravitational potential in the children on the slide and the rocking horse**
   - **elastic potential in the spring of the rocking horse**
   - **kinetic in the moving children and rocking horse**
   - **magnetic between the magnet and roundabout**
   - **thermal in the children, plants, objects, ground and slide due to friction**
   - **chemical in the banana**
   - **chemical in the muscles of the children and the trees**
   - **electrostatic in the hair of the child on the slide**

2. Explain how energy is transferred from the child to the slide.

   Energy is transferred mechanically by friction from the kinetic energy store of the child to the thermal energy store of the slide.

A battery-powered motor is used to lift a small mass off the ground. An energy transfer diagram for the system is shown below.



3. Write down the ways that energy is stored at the start and end of the process, and the pathways by which energy is transferred from place to place.

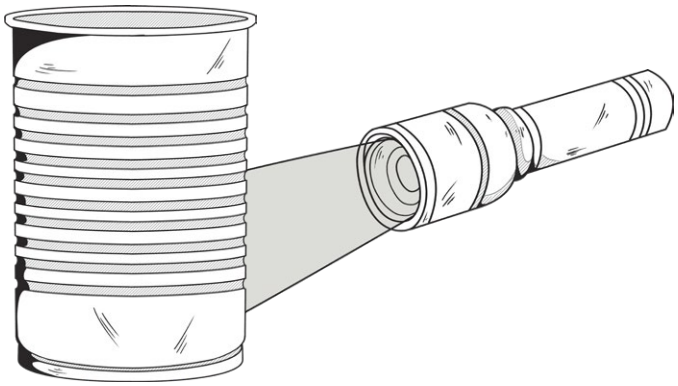
   store **A**: **chemical**

   store **B**: **gravitational potential**

   transfer **X**: **electrically**

   transfer **Y**: **mechanically**

A battery-powered torch is shone on a metal can containing water. The temperature of the water increases.



4. Explain how energy is transferred from the chemical energy store of the **battery**, via the bulb to the thermal energy store of the **can**.

   Energy is transferred electrically from the chemical energy store of the battery to the bulb, and then by heating via radiation to the thermal energy store of the can.

5. Explain why the temperature of the water increases.

   Energy is transferred from the thermal energy store of the can to the thermal energy store of the water by heating via particle movement/conduction.

Energy Stores and Transfers **Answers**

1. Describe where each of the energy stores can be found in the picture.

   nuclear: **in the power station**

   gravitational potential: **in the children on the slide and the rocking horse**

   elastic potential: **in the spring of the rocking horse**

   kinetic: **in the moving children and rocking horse**

   magnetic: **between the magnet and roundabout**

   thermal: **in the children, plants, objects, ground and slide due to friction**

   chemical: **in the banana, the muscles of the children and the trees**

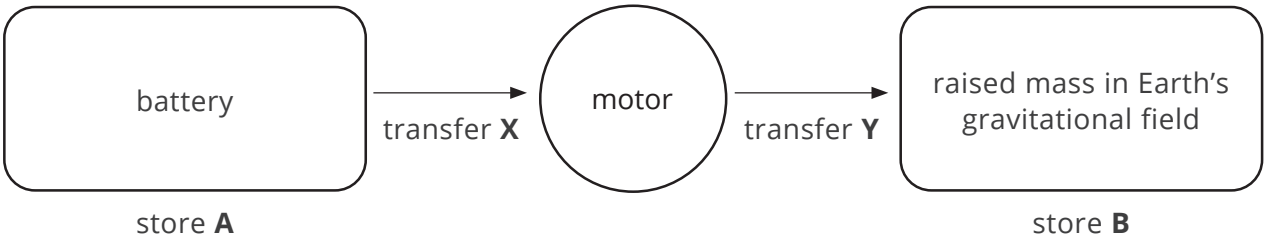
   electrostatic: **in the hair of the child on the slide**

2. As the child moves down the slide, energy is transferred mechanically to a thermal energy store of the slide.

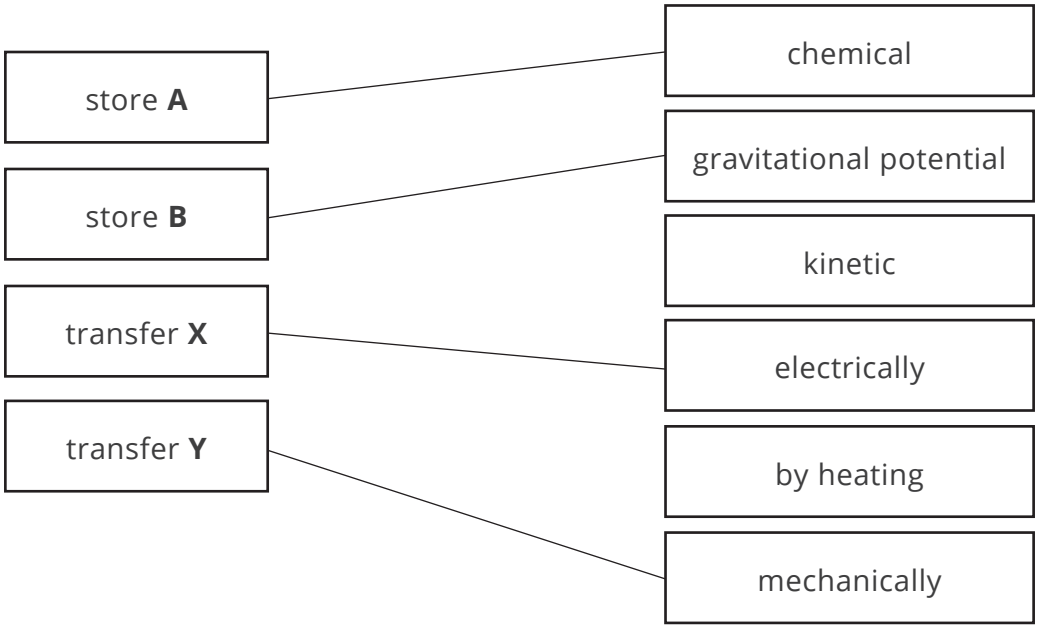
   Name the force that causes this energy transfer.

   friction

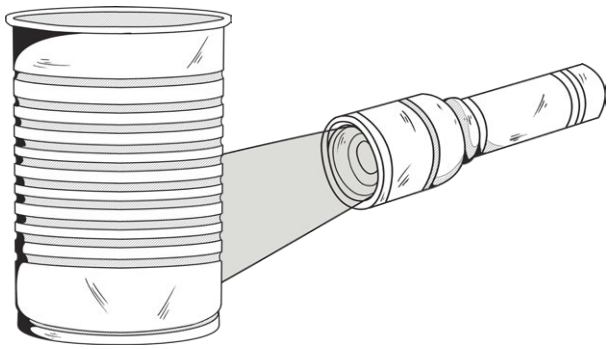
A battery-powered motor is used to lift a small mass off the ground. An energy transfer diagram for the system is shown below.



3. Draw **one** line from each label to the way that energy is stored or the pathway by which energy is transferred.



A battery-powered torch is shone on a metal can containing water. The temperature of the water increases.



4. Complete the sentences to describe the energy stores and transfers in the system.

Choose answers from the box. Some words may be used more than once.

chemical	electrically	particle movement	radiation	thermal

Energy is transferred **electrically** from the **chemical** energy store of the battery to the bulb, and then by heating via **radiation** to the **thermal** energy store of the can. Energy is then transferred by heating via **particle movement** from this energy store to the **thermal** energy store of the water.

Energy Stores and Transfers

1. Describe where each of the energy stores can be found in the picture.

   nuclear: _____

   gravitational potential: _____

   elastic potential: _____

   kinetic: _____

   magnetic: _____

   thermal: _____

   chemical: _____

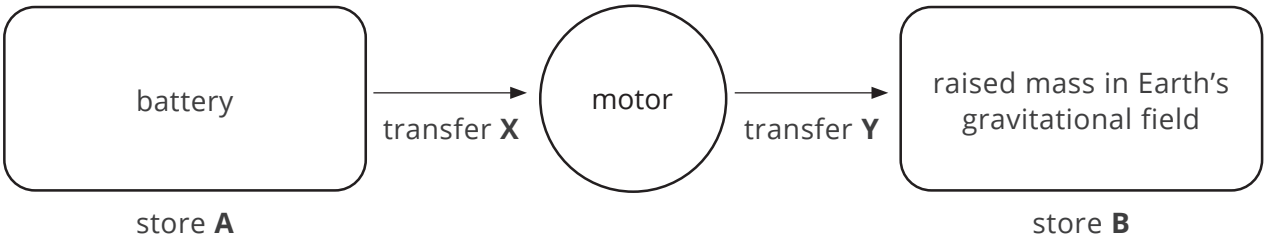
   electrostatic: _____

2. As the child moves down the slide, energy is transferred mechanically to a thermal energy store of the slide.

   Name the force that causes this energy transfer.

   _____

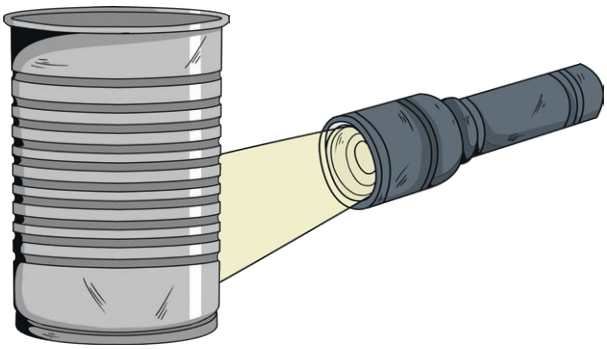
A battery-powered motor is used to lift a small mass off the ground. An energy transfer diagram for the system is shown below.



3. Draw **one** line from each label to the way that energy is stored or the pathway by which energy is transferred.

store **A**	chemical
store **B**	gravitational potential
transfer **X**	kinetic
transfer **Y**	electrically
	by heating
	mechanically

A battery-powered torch is shone on a metal can containing water. The temperature of the water increases.



4. Complete the sentences to describe the energy stores and transfers in the system.

Choose answers from the box. Some words may be used more than once.

chemical	electrically	particle movement	radiation	thermal

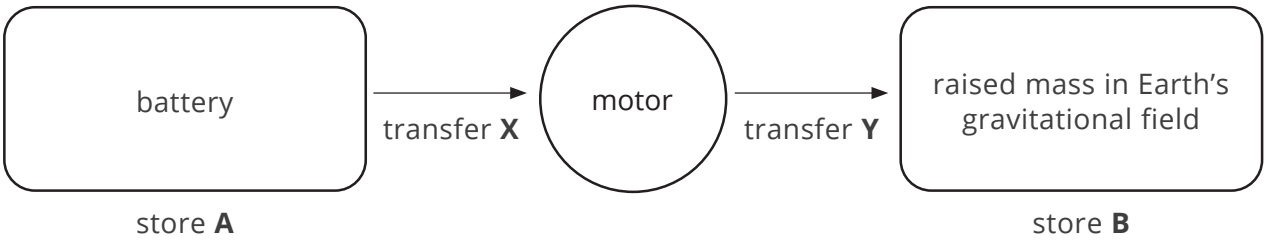
Energy is transferred _____ from the _____ energy store of the battery to the bulb, and then by heating via _____ to the _____ energy store of the can. Energy is then transferred by heating via _____ from this energy store to the _____ energy store of the water.

Energy Stores and Transfers

1. List all the ways that energy is stored in the picture.

2. Explain how energy is transferred from the child to the slide.

A battery-powered motor is used to lift a small mass off the ground. An energy transfer diagram for the system is shown below.



3. Write down the ways that energy is stored at the start and end of the process, and the pathways by which energy is transferred from place to place.

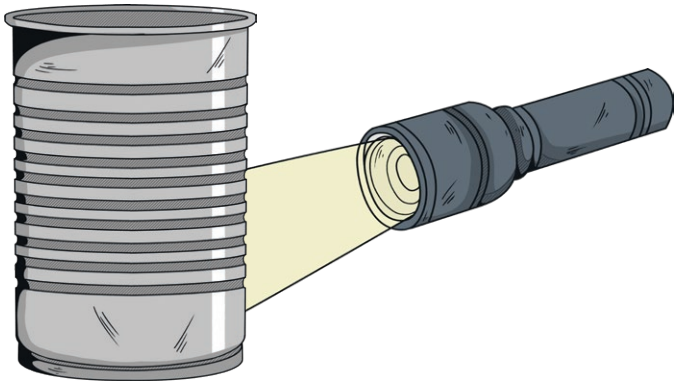
store **A**: _____

store **B**: _____

transfer **X**: _____

transfer **Y**: _____

A battery-powered torch is shone on a metal can containing water. The temperature of the water increases.



4. Explain how energy is transferred from the chemical energy store of the **battery**, via the bulb to the thermal energy store of the **can**.

_____

_____

_____

_____

5. Explain why the temperature of the water increases.

_____

_____

_____

Energy Stores and Transfers **Answers**

1. Describe where each of the energy stores can be found in the picture.

   nuclear: **in the power station**

   gravitational potential: **in the children on the slide and the rocking horse**

   elastic potential: **in the spring of the rocking horse**

   kinetic: **in the moving children and rocking horse**

   magnetic: **between the magnet and roundabout**

   internal (thermal): **in the children, plants, objects, ground and slide due to friction**

   chemical: **in the banana, the muscles of the children and the trees**

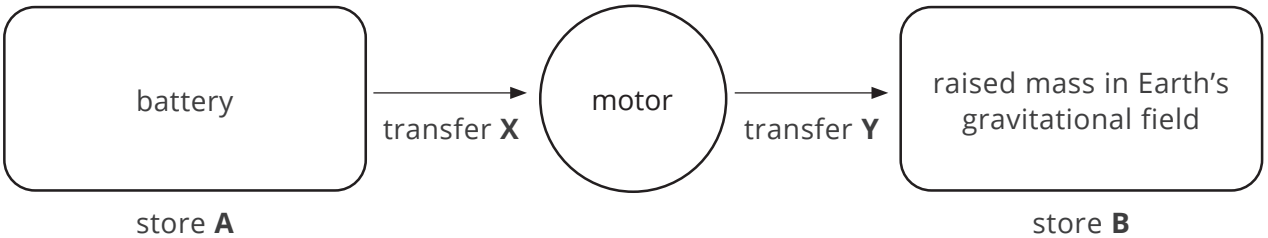
   electrostatic: **in the hair of the child on the slide**

2. As the child moves down the slide, energy is transferred mechanically to the internal (thermal) energy store of the slide.

   Name the force that causes this energy transfer.

   friction

A battery-powered motor is used to lift a small mass off the ground. An energy transfer diagram for the system is shown below.



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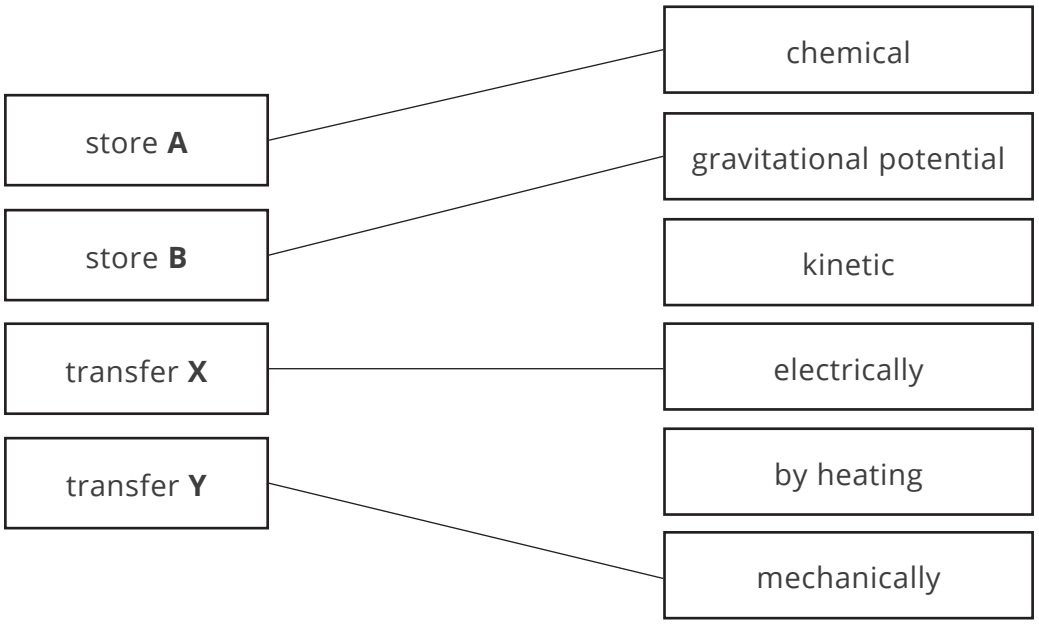

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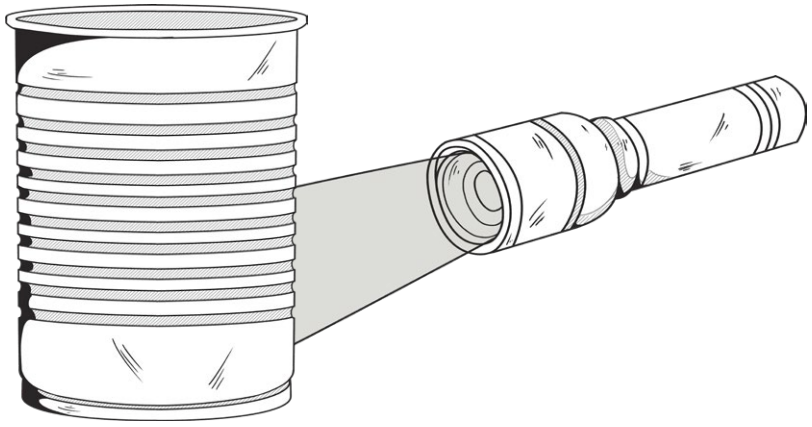

4. Complete the sentences to describe the energy stores and transfers in the system.

Choose answers from the box. Some words may be used more than once.

chemical	electrically	particle movement	radiation	internal

Energy is transferred **electrically** from the **chemical** energy store of the battery to the bulb, and then by heating via **radiation** to the **internal** energy store of the can. Energy is then transferred by heating via **particle movement** from this energy store to the **internal** energy store of the water.

Energy Stores and Transfers **Answers**

1. List all the ways that energy is stored in the picture.
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   - **kinetic in the moving children and rocking horse**
   - **magnetic between the magnet and roundabout**
   - **internal (thermal) in the children, plants, objects, ground and slide due to friction**
   - **chemical in the banana**
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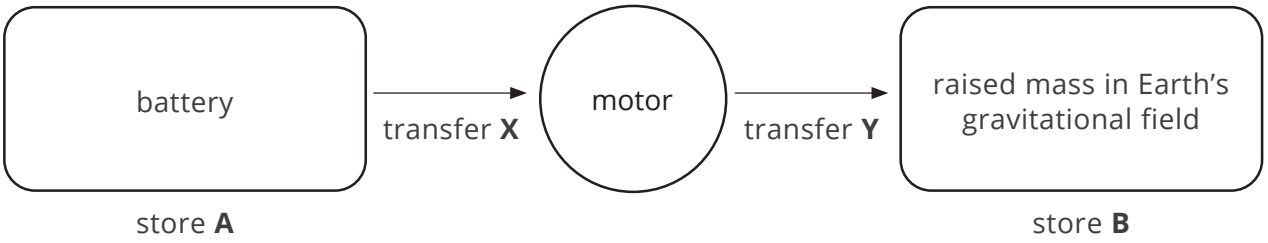

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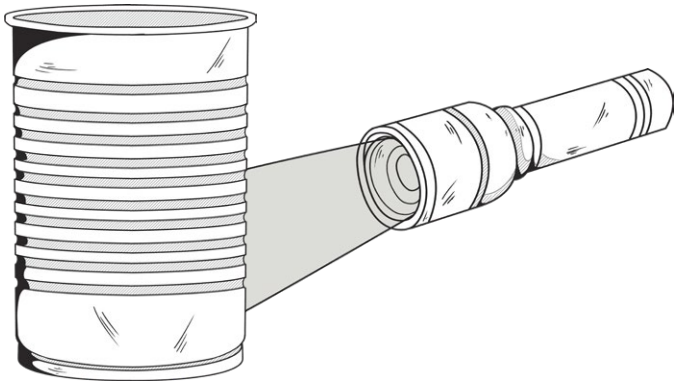

4. Explain how energy is transferred from the chemical energy store of the **battery**, via the bulb to the internal (thermal) energy store of the **can**.

   Energy is transferred electrically from the chemical energy store in the battery to the bulb, and then by heating via radiation to the internal (thermal) energy store of the can.

5. Explain why the temperature of the water increases.

   Energy is transferred from the internal (thermal) energy store of the can to the internal (thermal) energy store of the water by heating via particle movement/ conduction.

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1. Describe where each of the energy stores can be found in the picture.

   nuclear: _____

   gravitational potential: _____

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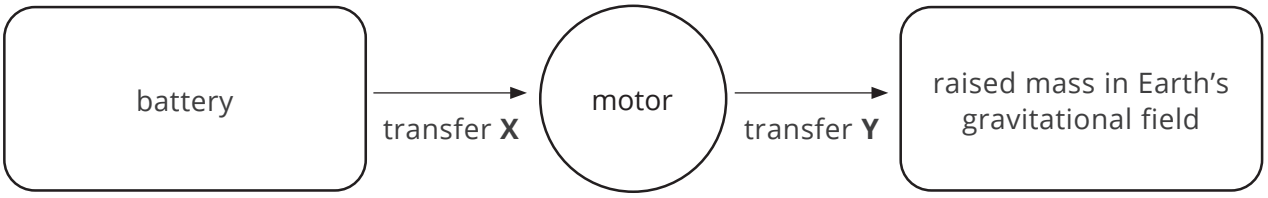

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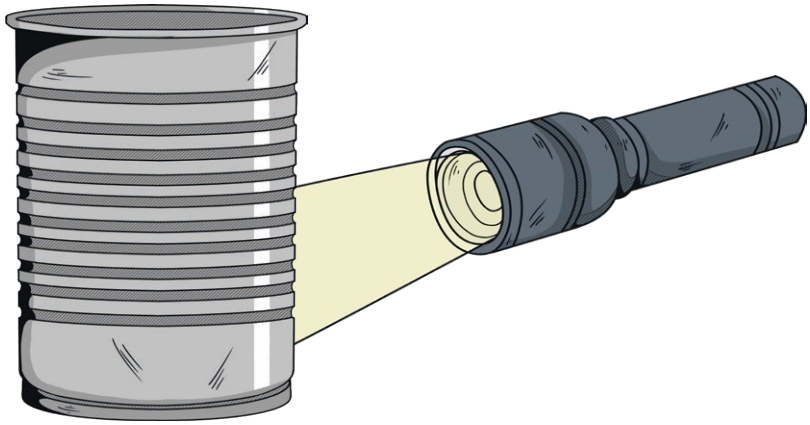

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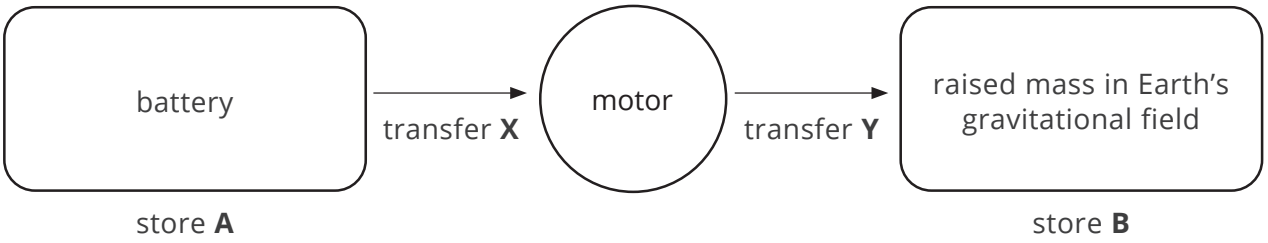

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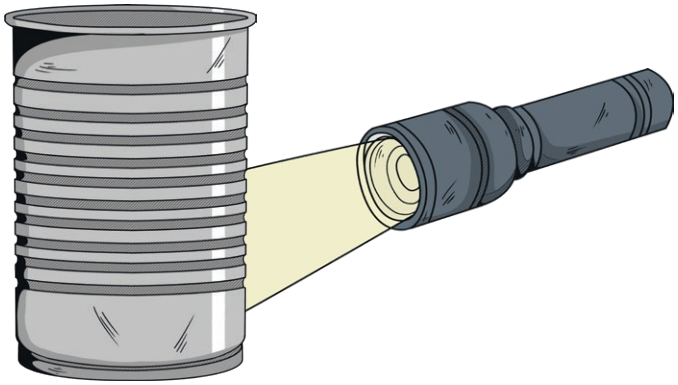

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