Science Exam on Monday

5/12/2022

Question السؤال	Lesson name*** اسم الدرس	Reference(s) in the Student Book - Aldiwan link (English Version) المرجع - الديوان (النسخة الإنجليزية) Page الصفحة
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VOCABULARY

Look for these words as you read:

direction
distance
motion
position
speed

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Describe an Object's Position

Position Think back to the *Moving Marble* activity. What position was the marble in when you started? Where did the marble end up after it was pushed down the ramp? When you describe the position of something, you compare it to the objects around it. **Position** is the location of an object. You can use words like *above, below, next to,* and *far away from* to describe the position of an object. Look at the boy on the beach. Draw an X on the inner tubes that are above the polka-dotted pink inner tube.

Distance The amount of space between two objects or places is **distance**. Millimeters, centimeters, meters, and kilometers are examples of units used in the metric system to measure distance. In the US customary system, distance might be measured in inches, yards, or miles. You can use a ruler or a meterstick to measure distance.

Motion

GO ONLINE Watch the video *Patterns in Motion* to compare how different things move.

Look at the pictures of the dog in different positions. First, you can see that the dog is on the ground. Next, you see the dog come completely off the ground. What happened to the dog? It moved. You know that the dog moved because its position changed. **Motion** is the process of changing position.

You can observe motion in different ways. Some objects move in a straight line. Other objects can move round and round, back and forth, or in a zigzag pattern.

Measuring Motion

GO ONLINE Explore *Draw the Pattern* to learn more about different patterns.

Distance There are many ways that you can measure motion. One way is to measure the distance that an object moves. As you learned on the previous page, distance is the measurement between an object's starting position and its current position. You can measure larger distances in units such as meters, yards, miles, or kilometers.

Time Suppose it took you three minutes to walk from your classroom to the playground yesterday. Today it took you five minutes to walk to the playground. You moved the same distance, but your motion today took more time. The time it takes to move a distance is one way to describe motion.

Speed Distance and time can be used to find speed. **Speed** is the measure of how fast or slow something moves. An object that is moving fast goes a distance in a short amount of time. It takes a longer time for a slower object to move the same distance.

REVISIT PAGE KEELEY SCIENCE PROBES Revisit the Page Keeley Science Probe on page 5.

VOCABULARY

Look for these words as you read:

- balanced forces
- force
- friction
- unbalanced forces

Forces

Objects do not move by themselves. A force must be applied to an object to change its motion. A **force** is a push or a pull. When you push on a door handle, you apply a force. When you pull on a wagon handle, you apply a force.

Forces can be large or small. The force that a train engine uses to pull a train is large. The force that your hand uses to lift a feather is very small. It takes larger, stronger forces to move heavier objects than it does to move lighter objects.

GO ONLINE Watch the *Forces Can Change Motion* video to see the effects of different forces.

There is another type of force called **friction**. Friction is a force that occurs when one object rubs against another. Friction pushes against moving objects and causes them to slow down. Imagine you are running across the gym. You are able to stop because there is friction between your shoes and the floor. Now imagine you are running on ice. It is harder to stop because there is less friction because the ice is very smooth. Smooth surfaces have less friction. When there is less friction, it is harder for an object to slow down and stop.

More than one force can push or pull on an object at a time.

Balanced and Unbalanced Forces

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Forces can set objects into motion. When you put a heavy backpack on your desk, the backpack does not move. Gravity pulls the backpack toward Earth, but your desk pushes up on the backpack with a force. The strength of that force is exactly equal to the pull of gravity. The forces are balanced.

Balanced forces are forces that cancel each other out when acting together on an object. Sometimes balanced forces are equal in size and opposite in direction, but forces do not have to be equal and opposite to be balanced. When an object is sitting still, all the forces acting on it are balanced. However, when objects are moving at a constant velocity, or speed, they are also balanced. Balanced forces do not cause a *change* in motion.

Suppose you push that heavy backpack across your desk. The backpack is moving. This is due to **unbalanced forces**. Forces that are not equal to each other are called unbalanced forces. If there is more than one force acting on an object, then the total of all the forces determines the direction of motion.

The forces applied to the stuffed bear are balanced, so it is not moving.

The dogs are applying a greater force to the sled, so the sled is moving.

Talk About It

Which forces cause a change in motion?

VOCABULARY

Look for these words as you read:

attract

electrical charge

repel

static electricity

Electrical Energy

The materials that you used in the *Static Charge* activity are all made of very tiny parts, called particles. All matter is made of particles. Some particles have either a positive or a negative charge. Electrical energy is the energy of these charged particles. The property of matter that causes electricity is **electrical charge**. You cannot see electrical charge, but you can understand how objects with different charges interact. Objects that **repel** each other push each other away. Objects that **attract** each other pull at each other. A discharge occurs when static electricity moves from one object to another.

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An object with a positive charge and an object with a negative charge attract.	
Objects that both have a positive charge push each other away.	
Objects that both have a negative charge also push each other away.	

The diagram shows how objects with positive or negative charges affect each other.

1. On the chart, label each particle as "p" for positive or "n" for negative.

2. Explore the simulation. What happens when you rub the balloon on the sweater?

The negative particles Transferred from the sweater to the balloon.

GO ONLINE Explore the PhET simulation *Balloons and Static Electricity*.

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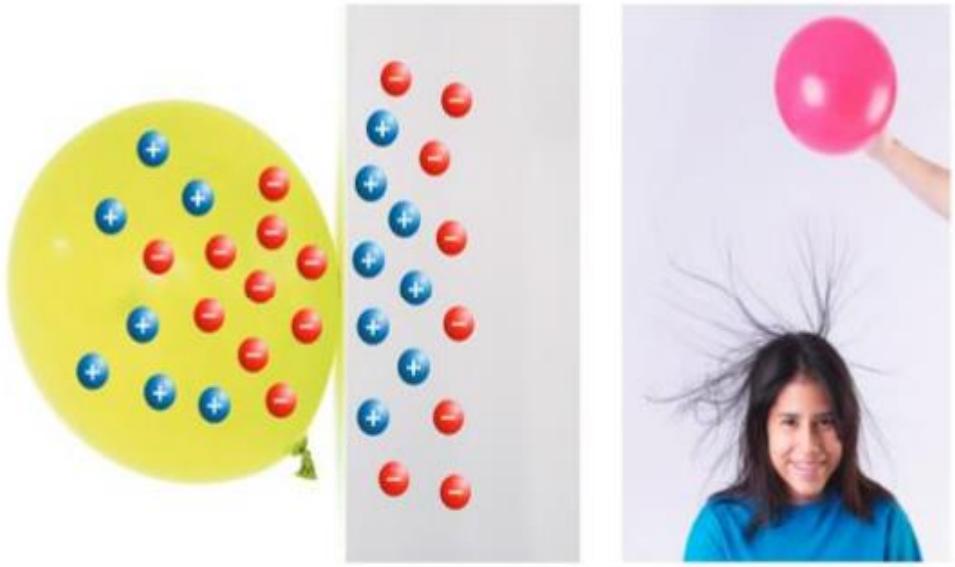
Static Electricity

All objects are made of charged particles. Most objects have the same number of positive particles and negative particles. When they do, the charges are balanced. When two objects touch, negative particles can move from one object to the other. Negative particles may build up on one object. That object has a negative charge. A buildup of electrical charge is called **static electricity**.

Think back to the *Static Charge* activity. After the balloon was rubbed, it had more negative particles. Those negative particles were then attracted to the positive particles in some of the objects and were repelled if the object also had a buildup of negative particles.



If you hold a charged balloon near a wall, the negative charge attracts the positive (+) particles on the wall. This attraction causes the balloon to stick to the wall.

Think back to the *Static Charge* activity. Why did you have to rub the balloon between each object?

The Balloon had to be rubbed to recharge the balloon.

REVISIT Revisit the Science Page Keeley Probe on page 49.

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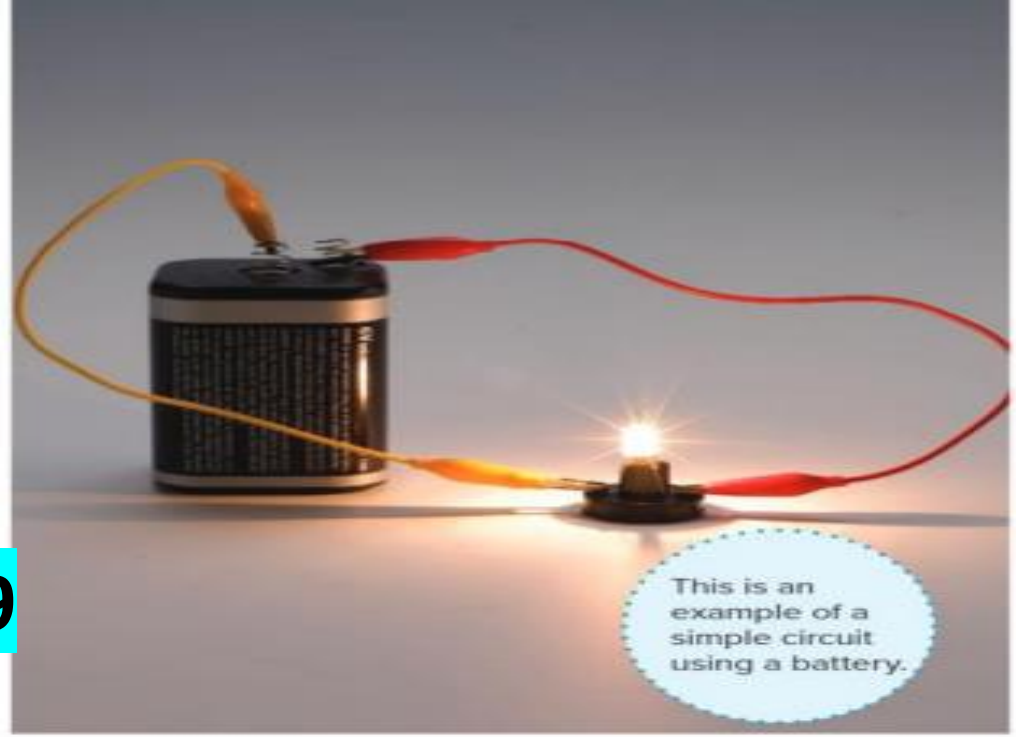

Electric current needs a path through which to flow. A circuit is a path that is made of parts that work together to allow current to flow. Simple circuits have several parts. A battery or an electric outlet may be the circuit's source of power. Wires connect the different parts of the circuit. These wires are usually made of copper or another type of metal, and are wrapped in plastic. The last part needed to complete a simple circuit is a load. A load is the device that needs an electric current to work.

People use the energy flowing through electrical currents every day. Look around your classroom. What do you see that uses electricity?

Make Connections

Talk About It

Think about how energy flows in static electricity. Compare it to how energy flows in a circuit.

Notes

Magnets

A **magnet** is made of material that can attract objects made of iron, cobalt, steel, and nickel. The ability of an object to push or pull on another object that has magnetic property is called **magnetism**. Magnets can attract and repel each other with magnetic forces. Objects attract if there is a force that pulls them towards each other. Objects repel if there is a force that pushes them apart.

Magnetic Poles

Magnets can be made in different shapes and sizes. Magnets sometimes have *N* painted on one end and *S* on the other end. The *N* stands for *north*, and the *S* stands for *south*. Each magnet has a north pole and a south pole. A **pole** is one of the two ends of a magnet where the magnetic force is strongest.

If you hold two magnets close to each other, you can feel a push or pull between them. The diagram on the next page shows how magnets attract or repel each other.

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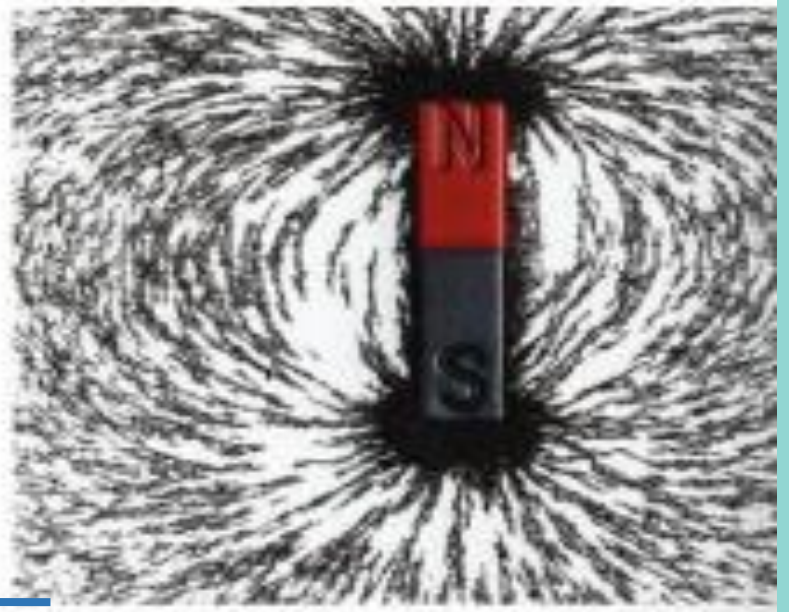
Magnetic Field

If you want to throw a ball, your hand has to touch the ball. A magnet can push or pull an object without touching it. It does have to be close enough to the object to be in its magnetic field.

A **magnetic field** is the area around a magnet where its force can attract or repel. You cannot see a magnetic field, but you can feel where it is. If you bring two magnets close, you can feel them push or pull each other. Even when the magnets do not touch, their magnetic fields interact. If you move the magnets far apart, you do not feel the push or pull any longer. The magnetic fields are no longer meeting.



Bits of iron were sprinkled around this magnet. The bits of iron show the magnetic field.

GO ONLINE Explore with *Effects of Magnets* to see the actions of a magnet's north and south poles.

Look back at the Inquiry Activity, *Magnet Investigation*. Why did the magnet only attract certain objects?

The magnet attracted objects made of certain materials.

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Strength of Electromagnet				
Number of Times Wire is Wound Around Nail	1 Battery	Number of Paper Clips	2 Batteries	Number of Paper Clips
20		5		7
30		7		9
40		11		16

6. Wind the wire 10 more times. Record the results in the table. How did the number of times the wire was wound affect the number of paper clips picked up?

When the wire was wrapped more times, more paper clips were picked up.

7. Now dissemble the electromagnet. Go back to the beginning of the activity. This time, connect a second battery in the series.

Communicate Information

8. Did your observations support your prediction? Explain.

Yes.

9. How did adding a second battery affect the strength of the electromagnet?

The electromagnet picked up more paper clips with two batteries.

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Using Magnets

A magnetic field forms around a wire if a current flows in the wire. If you wind the wire into a coil, the field is stronger. When a current flows in the wire, the coil becomes a magnet. The magnet is stronger if you place a metal bar inside a coil. An electromagnet is a coil of wire around a metal bar, such as an iron nail. A battery at the ends of the wire makes a current flow in the wire.

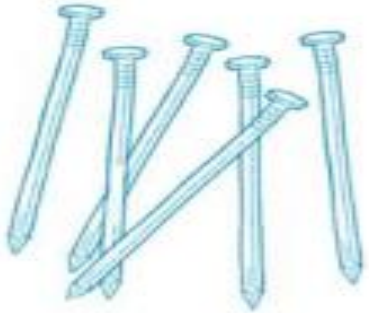
GO ONLINE Watch the video *Magnets Solve Problems* about uses for magnets.

You can turn an electromagnet on and off with a switch. The switch makes electromagnets useful in many electric devices, like speakers and doorbells.

1. What causes the magnetic field in an electromagnet?

2. What are two ways to make the electromagnet stronger?

Wrap the wire around the nail more times and, increase the strength of the battery.



Page 78

VOCABULARY

Look for these words as you read:

competition

ecosystem

resource

Although most plants grow in soil, a plant can also grow in water without soil if it gets the nutrients it needs.

Plant Needs

Like all organisms, plants have needs. Plants get everything they need from their environment. Living things that do not get what they need may die. Plants need air, water, nutrients, light, and space to live.

Plants get a gas called carbon dioxide from their environment. Plants take in the gas through their leaves. They use this gas to make food.

Like all living things, plants need water. They take in water through their roots. Water travels from the roots, up the stem, to the leaves. Plants use water for many life functions. Water helps a plant to stand up. It keeps a plant from wilting. A plant also uses water to make food.

Nutrients are substances that help living things grow and stay healthy. Nutrients are dissolved in water. Plants absorb nutrients when they take in water through their roots.

The green parts of plants collect the energy in light and use it to make their own food.

Plants need space to grow and to get water and sunlight. Different plants need different amounts of space.

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2. Think back to the Inquiry Activity, *Plant Hunt*. Why might the plant in one location grow taller and greener than the plant in the other location?

The plant receives more water, light, nutrients, or space.

Page 10

Animal Needs

In order to stay alive, animals need certain things. These include food, water, oxygen, space, and shelter.

Animals need food because it gives them energy to move and grow. Different animals have different physical traits to help them get food. Some meat eaters, like tigers, have sharp teeth to help them bite and tear meat. Many plant eaters, such as cows, have large, flat teeth for chewing.

Animals need water because it helps them turn food into energy and get rid of waste.

Animals need oxygen, which is a gas. Animals get oxygen by breathing. Most land animals use lungs to get oxygen from the air. Some animals that live in water get oxygen from the water by using gills.

Animals need space to move around, grow, find food, and raise their young. Different animals need different amounts of space.

Animals need shelter, or a safe place to be. No animal can be alert all the time, which means it needs somewhere safe to go. Zebras live in herds, so some zebras can keep watch while others sleep.

Elephants use their trunks to lift drinking water to their mouths.

When in danger, a turtle will hide its head, legs, and tail inside its shell.

1. Circle five things animals need to survive.

Page 13

Ecosystem

Living things live in ecosystems. An **ecosystem** includes all the living and nonliving things that interact in an environment. Living things include plants and animals. Nonliving things include rocks, soil, water, and air.

A **resource** is a material that living things use to survive. Living things get resources from their ecosystems. For example, plants and animals get the air and water they need from their environments. But every ecosystem has a limited amount of resources. As a result, living things must compete for them. **Competition** is the struggle among living things for resources. When organisms cannot compete, they cannot get the resources they need. They may die or move to another ecosystem.

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Explain what could happen to the ecosystem below if the cattails disappeared.

Animals in the ecosystem will have less to eat and no shelter.

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VOCABULARY

Look for these words as you read:

adaptation

camouflage

hibernate

migrate

mimicry

Adaptations

Different beak sizes and shapes allow birds to gather food in different environments. This is an example of adaptation. An **adaptation** is a structure or behavior that helps an organism survive in its environment.

The frog uses its sticky tongue to capture an insect to eat.

Spiky edges on its leaves protect the bush from being eaten.

A polar bear has an adaptation called **camouflage**, which means it blends into its environment. Camouflage helps living things stay safe. A snake's skin pattern may match the ground it lies on, making it difficult for a predator to see the snake.

Some animals are adapted to living in cold climates. Sea lions and walruses have a layer of fat called blubber under their skin that helps them stay warm. Some animals are adapted to survive in hot temperatures. Camels have patches to protect their legs so they are not burned when the camel kneels.

1. Circle two examples in the text that show adaptations in animals.
2. Why don't all animals have the same adaptations?

Different environments cause different adaptations.

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INQUIRY ACTIVITY

Hands On

Camouflaged Beans

Investigate how camouflage helps organisms hide from predators.

Make a Prediction Will black beans or black-eyed peas be harder to separate from white beans?

The black-eyed peas will be harder to separate.

Materials

- 3 clear plastic cups
- white beans
- black beans
- black eyed peas
- white sheet of paper
- stopwatch

Carry Out an Investigation

1. On a white sheet of paper, mix some of the white beans with some of the black beans.
2. **Record Data** Time how long it takes to separate all the black beans from the white beans.
3. On the white sheet of paper, mix some of the white beans and some of the black-eyed peas.
4. **Record Data** Time how long it takes to separate all the black-eyed peas from the white beans.

	Black Beans	Black-Eyed Peas
Time (seconds)	25 seconds	45 seconds

Communicate Information

5. Did your results support your prediction? Explain.

Yes, black beans were easier to separate than the black-eyed peas.

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Desert Adaptations

A desert is a very dry environment. It rarely rains in a desert. When rain does fall, it can pour down heavily. Temperatures are often very hot during the day and cold at night. Organisms that live in a desert have adaptations to help them survive in these conditions.

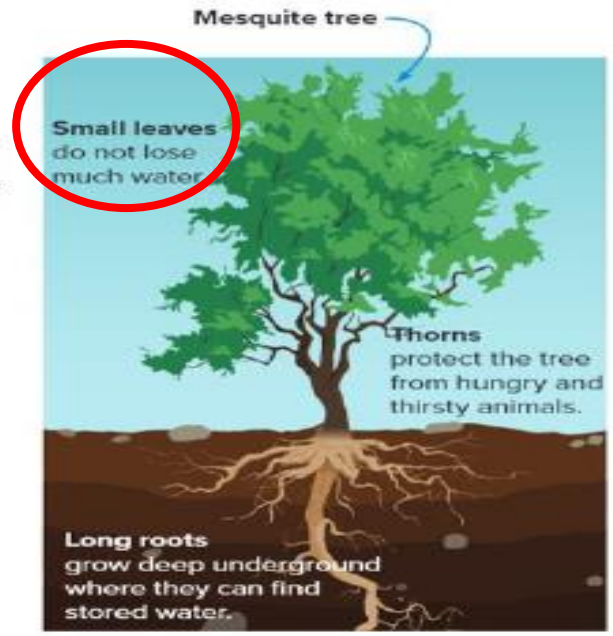
Water

Desert plants cannot depend on regular rainfall for their water. Instead, their roots are adapted to spread widely or grow deep to find water. A desert plant has stems adapted for storing water. Many desert animals get their water by eating plants or other animals.

Temperature

Desert animals have adaptations to keep them from being too hot during the day. Coyotes and rattlesnakes are nocturnal. This means they are active at night and sleep during the daytime. Jackrabbits stay cool by having small bodies and long ears. This helps the heat escape from their bodies. Some animals have light-colored bodies. Light colors absorb less heat.

Circle two adaptations that help desert plants live for long periods of time without water.



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Ocean

GO ONLINE Watch the *Extreme Habitats* video to learn about extreme adaptations.

Oceans are home to millions of living things. Each living thing has adaptations that help it survive in the salty water.

Algae

Seaweeds look like plants, but they are not. They are plant-like organisms called algae. Like plants, algae make their own food from sunlight. Most algae have structures that are like leaves. Some algae have root-like structures for attaching themselves to the ocean floor. Because they need sunlight, rooted algae can only live in shallow water. Algae that have no roots drift near the ocean's sunlit surface.

Kelp is a kind of algae. This picture shows a seaweed forest of kelp.

Ocean Animals

Whales and dolphins breathe air. They can hold their breath for a long time as they dive deep to look for food. When they need to breathe, they rise quickly to the surface. Fish, on the other hand, have gills for getting oxygen from water.

Many ocean animals have fins. Fins help them swim quickly and control their movement. Ocean animals swim for long distances when they migrate. To **migrate** means "to move from one place to another." Animals migrate to find food, to reproduce, or because the water temperature has changed.

When sperm whales migrate, they swim in groups called pods. The whales swim together for thousands of kilometers.

1. Circle two types of ocean animal adaptations.
2. Why do animals migrate?

Animals migrate to find food, or because temperature has changed.

REVISIT Revisit the Page Keeley Science Probe on page 23.

PAGE KEELEY SCIENCE PROBES