Magnets and Migration: Introduction
Transcript

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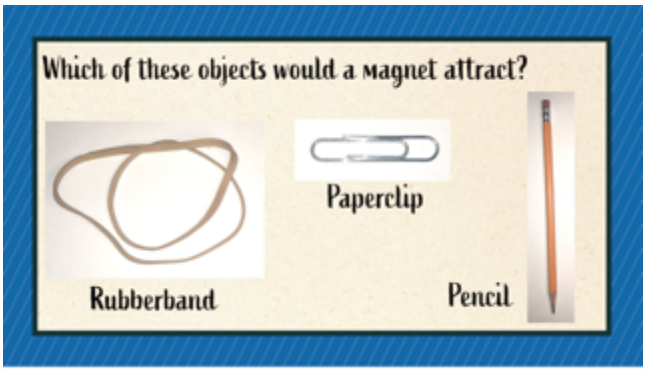
[background music]

Have you ever met someone that just had a really good sense of direction, and they always know where they are? How are they able to do that? If you live in Las Cruces, maybe they always look for the Organ mountains and they know that they're to the east of town. Maybe they have a really good sense of time, and they look at the sun's position in the sky. Or if you're walking in your neighborhood, maybe they just look for landmarks that they recognize. We can also use the GPS on our phone, or even a map and compass if we have to.

Animals don't have maps or GPS, but a lot of them have a great sense of direction. Just think about migrating birds. They fly thousands of miles back and forth between summer and winter habitats each year. How are they able to find their way over such a long distance? Do they look for landmarks? Do they use the position of the sun? Or is there something even more innate that they can sense? This is a really interesting question, because scientists don't really know the answer, and it could be a combination of many different factors.

One theory is that birds have some sort of internal compass, and that they're able to sense the earth's magnetic field. This is called magnetoreception, and scientists think that many different animals have this sort of sixth sense for navigation.

To understand how this phenomenon works, we need to understand magnetic fields. In this video, we'll talk about magnets and how the earth's magnetic field works. Then you'll conduct an investigation. You'll see if you can make a model of the earth's magnetic field and explain how it exerts a force on objects without touching them. Let's start with some basics. You already know that magnets attract different things, so which of these objects would a magnet attract? If you have a magnet with you, try to find something around your home that it sticks to.



Edpuzzle Question: Which of these objects would a magnet attract?

A. *Rubberband*
B. *Paperclip*
C. *Pencil*

Magnets only attract objects with certain types of metal in them like iron, nickel and cobalt. Magnets can push and pull on each other because they're surrounded by an invisible magnetic field. When magnetic fields overlap, they can exert a magnetic force, even if the magnets themselves aren't touching.

If these magnets are close together, we can see that they attract or repel each other, but what if we hold them far away? Far apart, nothing will happen because the magnetic field of this magnet isn't strong enough to exert a force on the other magnet unless they're close together.

You'll notice that this magnet is labeled north on one end and south on the other. If I hold them close together, the north end of one magnet attracts the south end of the other. But if the north ends come together, they push apart. The north ends repel each other. These ends of the magnet are called magnetic poles.

The earth also has magnetic poles. In fact, the earth acts like a giant bar magnet, which has a magnetic field created by the electromagnetic force in the earth's core. The molten metal in the earth's core is constantly moving, and this creates an electric current similar to electricity in a wire. The electric current is what creates the earth's magnetic field. We can't actually see the earth's magnetic field. It reaches out into space and it's invisible to us, but we can build a model to help us understand its shape.

In the next assignment, you'll use what you know about magnets to see if you can visualize the earth's magnetic field, and consider how migrating birds might use it to migrate. Head back to Canvas and click next to get started on the investigation assignment.

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