Lesson: “What's the biggest excavator?”

VIDEO TRANSCRIPT

EXPLORATION VIDEO 1

Hi, it's Doug! Do you ever use your imagination? You know, your ability to make a picture in your mind. Well, one of the things I love to imagine is what the future will be like. Especially to imagine what kinds of machines people might invent in the future. Take anything you don't like to do. For example, I don't really like to cook. Well, you can imagine a machine that could do all the cooking for you. It could use a frying pan. It could chop up any vegetables you need. That would be an awesome machine. Or imagine a machine that could bring all your dirty clothes to the laundry room for you. Or a machine that could pick up all your toys for you in your super messy room. That would be awesome. Maybe one day in the future someone will invent a machine that does that. But you might not have thought about this: To people who lived a long time ago, you're living in the future. We have all kinds of machines today that people back then never had. Nearly all of the things we have around us today were made with the help of machines. Machines helped make our shoes. And there are machines that help us build houses. And machines that help us make toys. And even machines that help us make food, like this chocolate bar. But a long time ago, to make any of these things, all of the work had to be done by hand. There was lots of hard work—like, if you wanted to make chocolate, you'd have to grind up the chocolate by hand, like this. Or if you wanted to wash your clothes, you'd have to

scrub the clothes by hand, pushing the soap back and forth. Or if you wanted to build something out of wood, you'd have to push and pull a saw back and forth. So grinding, scrubbing, pushing, and pulling. We might call these the work words. We used to do these work words by hand. But now there are machines that do these work words for us. Like now, we don't have to scrub soap into clothes by hand because washing machines scrub the clothes for us, spinning them around until they're all clean. Now I have a question for you. I sent it to your teacher so that you can read it together.

EXPLORATION VIDEO 2

Machines are all around us. But sometimes you don't realize it because most of them are big boxes, where we can't see all the parts inside that are working. And machines just seem like magic, don't they? I mean, think about it. You just put dishes in a dishwasher, you hit a button, and poof! The dishes are clean. It's great. But it's not just poof. Inside every machine are parts that do work, just like if you were to do it by hand. Let's have a look inside a dishwashing machine. We'll see the view from a camera in there so we can tell what happens. You see this? A dishwashing machine does work words too. It sprays water and spins, scrubbing the dishes clean. Or take this mixing machine, for example. This is a machine you use in the kitchen, like if you want to mix up the ingredients for a cake. You hit a button, and poof! The cake ingredients get mixed. But before there were mixing machines, you had to mix ingredients by hand, like this. This is a hand mixer. This took a long time, and it was a lot of work. You might get so tired, you even have to switch hands as you do it. Same for this. Do you know what this is? It's a drill. A machine for making holes in wood. But before this machine was invented, if someone wanted to put a hole in a piece of wood. You had to do it by hand with this thing. It's called a hand drill.

Anytime you want a machine to do work for you, the machine has to have parts that can do the work words. A dishwashing machine has parts that can scrub. A mixer machine has parts that can mix. And a drill has parts that can drill. Now, say that you wanted to do something really big. Say you wanted to build a swimming pool in your backyard. What work words would you need to do in order to do something this big? Well, you're going to need to dig a big hole, right? And that means you have to move a lot of dirt from one place—down here in the ground—to another place—up here in a pile. How long do you think it would take to dig a hole for a swimming pool if you had to do it all by hand?

ACTIVITY INTRODUCTION VIDEO

In today's activity, you're going to dig a big hole. Since we don't have any real dirt here, you're going to use your imagination. First, you're going to dig with a pretend shovel. Then you're going to dig with a pretend digging machine. It's called an excavator. If you've ever dug a hole in the dirt, you know it's a lot of work. Before you start digging, think about the work words that you do. Here's someone digging a hole with a shovel. Now he's moving dirt from down in the ground to up here in a pile. What's the first thing he does to shovel? Well, let's look. He shoves the shovel down into the dirt with his foot. Shove. That's a work word. It's actually another word for push. And after that, he lifts the dirt up. Another work word. Then what? Then he moves the dirt away from the hole. And last, he tosses the dirt out of the shovel. Put all these work words together and you get push, lift, move, and toss. Okay, let's try it now with an imaginary shovel. And after that, we'll try it like an excavator. I'll show you how, step by step.

ACTIVITY STEP 1

Stand up and find a spot where you have space to move. When you're done with this step, press the arrow on the right.

ACTIVITY STEP 2

Get a pretend shovel. Put one end on the ground, and get ready to dig. Ready? Go! You're going to push down. You're going to lift up. You're going to move it over and dump it out. Good job! That's one scoop of dirt. Let's do another scoop. Ready? Go! You're going to push down. You're going to lift up. You're going to move it over, and dump it out. All right, that's two scoops of dirt. Let's do one more scoop. Ready? Here we go! You're going to push down. You're going to lift up. You're going to move it over, and dump it out. All right, that's three scoops of dirt. Great job! Go to the next slide to see how much dirt you dug.

ACTIVITY STEP 3

Here's the imaginary hole you dug. Oh, that's a pretty good start. But it's going to take a lot more work to dig a big enough hole for a pool. Could a digging machine help? To find out, go to the next step.

ACTIVITY STEP 4

Watch what this digging machine does and listen for the work words. Ready? First, it's going to stretch out like this and push down into the dirt, lift the dirt up, turn, and dump it out. Let's watch

that one more time. It's going to stretch out, push down, lift and turn, and dump it out. Now let's try it together. Go to the next slide.

ACTIVITY STEP 5

Now, you're going to dig like an excavator, a digging machine. Get ready. Here we go! You're going to stretch out. You're going to push down. You're going to lift and turn and dump it out. Good job! All right, that's one scoop of dirt. Let's do another scoop. Ready? Here we go! You're going to stretch out. You're going to push down. You're going to lift and turn and dump it out. All right, that's two scoops of dirt. Let's do one more scoop. Ready? Here we go! You're going to stretch out. You're going to push down. You're going to lift and turn and dump it out. That's three scoops of dirt. Great job! Go to the next slide to see how much dirt you dug.

ACTIVITY STEP 6

Whoa, look at the hole your digging machine dug. A few more scoops and you'll have a pool. Well done! Go to the next step.

ACTIVITY STEP 7

Okay, sit down and discuss—if you had to dig a big hole, which way would you do it and why?

ACTIVITY STEP 8

You've been watching an ordinary digging machine, but this is the world's biggest digging machine. There's a man in this picture—can you find him?

ACTIVITY STEP 9a

How long do you think that it would take to dig a swimming pool with this machine? You can hear the answer in the next slide.

ACTIVITY STEP 9b

The scoop of this giant excavator is more than twice as tall as the man standing there. That's big! This scoop can lift almost 100 tons of dirt. With a scoop that big, this machine could dig 44 swimming pools in an hour. So it would take a machine like this less than two minutes to dig just one swimming pool. It does all of this work using pushes, pulls, and other work words, just like you would do if you were digging it by hand. But the machine is bigger and so are the pushes and pulls. Stay curious and see you next Mystery!