

Forces and Motion

Hi, I'm Cassie. Welcome to Real World Science.

THEME SONG: Real World Science. Real World Science.

Every day the world is shaped and changed by forces. Forces set the world in motion, so get ready to move as we explore forces in a real world.

[THEME MUSIC]

THEME SONG: Real World Science. Real World Science. Science in the real world.

Ever wonder what causes things to move faster than a speeding train, or slower than a tortoise? Or what makes things stay still and not move at all? The word is force. Right at this very moment forces are at work all around you and me. Forces make it possible to sit-in a chair without floating in space, or falling into the earth.

What is force? Simply stated, force is a push or a pull on an object that causes a change in its motion. Forces are involved in just about everything you do, every single day. Every force is either a push--

[CREAK]

--or a pull.

[CREAK]

Pressing a button--

[BOING]

--closing a drawer--

[CROAK]

--and throwing a snowball--

[WHOOSH]

--are examples of a push.

[FLUTTER]

While opening the door--

[CROAK]

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--unplugging a wire--

[ZING]

--and lifting a book--

[CREAK]

--are examples of a pull. These push and pull forces exist throughout the universe and help to shape and change our world. For example, the moon pulls on the oceans causing low and high tides.

[JINGLE]

A magnet pulls iron particles towards it--

[BOOM]

--and a nuclear explosion pushes objects out with tremendous power. We'll talk more about that later. First, let's take a look at some kids playing tug of war. Tug of war is an excellent example of a force that is a pull. [CREAK]

Now, when a force is exerted on any object it causes a reaction. In this case, you'll notice that at some points neither team moves. Why? Well, it's because the force is balanced. When both teams are exerting an equal amount of force neither team moves.

But if one team begins to exert more force than the other, the weaker team gives up ground, and the balance of forces is nullified. Let's repeat those basic concepts one more time. Every force is a push--

[CREAK]

--or a pull.

[BOINK]

All forces are either balanced--

[CREAK]

--or unbalanced.

Forces make it possible for these cheerleaders to make a pyramid. In order for the pyramid to keep its shape, the forces must remain balanced. All of the people in the pyramid must exert equal amounts of force on each other. If the forces become out of balance, the pyramid will collapse--

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[CRASH]

--and change shape until the force is balanced again.

