Chapter 2

Almost everyone gets into a car every day. Let's think about some of the steps it takes to drive a car. The first thing you should do, of course, is put on your seat belt. Then, the driver puts the key in the keyhole, turns it and in a few moments you are driving down the road. You may not know this...

...but you just watched a huge amount of science taking place!

Let's look a little closer at what just happened!

The seat belt didn't move by itself, did it? (If it did, run! Get out of the car quick!) Of course not! You had to move your arm and pull the handle of the seat belt down to lock it in place. Whenever you pull or push something you are using **force**.

We are going to be talking a lot about force in this chapter!

Now, what about the driver and the key? It took a lot of force to hold onto the key, pull it up to the keyhole, push it into the hole and then to turn it around to start up the car! Wow! That is a lot of pushing and pulling!

Once the car starts to move, scientists would say it is in **motion** ("mow-shun"). Motion takes place when the distance between two objects is changing. IN this example, as your car starts to roll away from your house, the distance between the car and the house is getting bigger. So, your car is in **motion**!

Now, imagine you have been in the car for a long time now. You have been busy reading, drawing or playing with your toys...

...and you never looked outside the windows!

How do you know you are getting closer to where you are going? This is when you need something called a **reference point** ("reff-fren-sss"). Scientists use reference points to determine if an object is in motion. Trees, signs and buildings are good reference points because they are **stationary** ("stay-shun-air-ee"). Stationary means they do not move on their own!

While you are driving in your car, you may not have noticed you were in motion. However, if someone was standing on the side of the road by a tree or a sign, they would easily say that your car was in motion!

Here's another question for you:

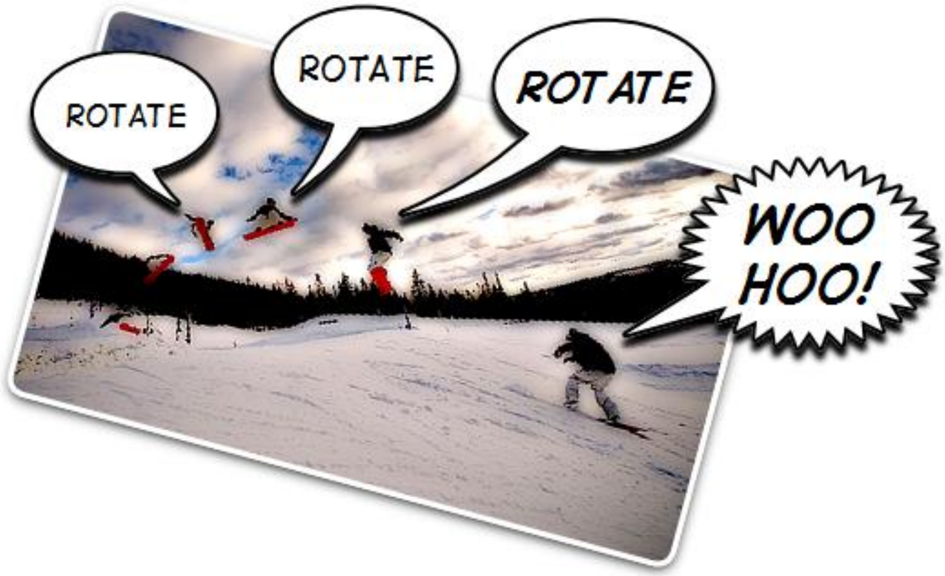
Are you in motion as you read this chapter?

Most of you would say **NO!** And, if you were using your chair a reference point you would be correct. However, what if you used something different as your reference point? **How about we use the sun?!**

If the sun could talk, it would say that you are always in motion! But how can this happen? It doesn't feel like you are in motion right now, does it? But the truth is,

You are always in motion!

Here's why...



Our planet is always in motion around our sun. This is known as a **revolution** ("rev-o-loo-shun"). Imagine running around your house right now... you would be revolving around your house! The path of our planet around the sun takes one year or about 365 days!

Not only are we revolving around the sun, the earth also spins like a top! This is known as **rotation** ("roe-tay-shun"). It takes earth one day to rotate all the way around itself one time! So, if you were to ask the sun if you are in motion right now it would have to say **yes**!

Whether or not an object is in motion depends on its reference point.

This is what is known as **relative motion**. If we were to use the chair as the reference point, you would not be in motion right now. But, if we used the sun as a reference point, you **would** be in motion!

This is why choosing a reference point is so important when you measure motion!

Let's look at another example of relative motion. Imagine two basketball players jumping off of the ground trying to grab a ball in the air.

The relative motion from the **ground** is that the ground itself is stationary. However, both the players and the ball are in motion.

The relative motion from the **players** is that the ground appears to be moving away but they do not seem to be moving away from each other. The ball, however, does seem to be moving closer to them!

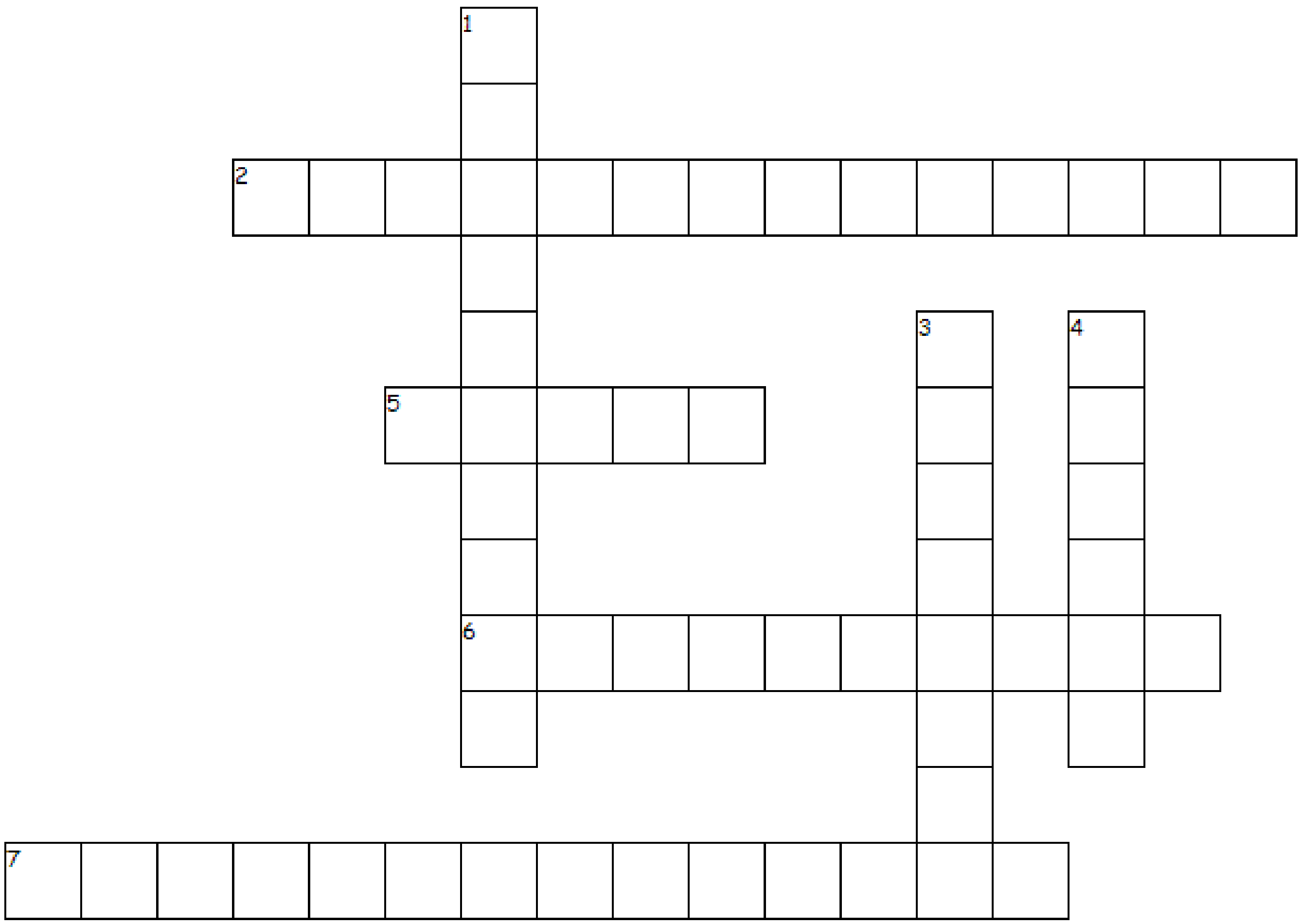
The relative motion of the **ball** is that the ground is stationary. However, both of the players seem to be in motion... and they are getting closer every second!

With all of this motion going around, we need a way to measure how fast an object can travel. That is what you are going to explore next week! Stay tuned!

Imagine riding your bike around your house. How do you know that you are in motion? Use the following words in your answer:

Reference Point
Stationary

Place the answers to the following clues in the boxes below. Each box should contain one letter.



ACROSS

2. the motion or of an object as seen by a reference point
5. a push or a pull
6. movement of an object around another object
7. areas used to determine if an object is in motion

DOWN

1. objects that do not move on their own
3. spinning movement of an object
4. occurs when the distance between two objects is changing

Match the following definitions with the words below

1. ____________________ areas used to determine if an object is in motion

2. ____________________ occurs when the distance between two objects is changing

3. ____________________ the motion or of an object as seen by a reference point

4. ____________________ objects that do not move on their own

5. ____________________ a push or a pull

6. ____________________ spinning movement of an object

7. ____________________ movement of an object around another object

motion	rotation
stationary	reference point
relative motion	revolution
force	