

Explain

Create an Explanation

After scientists get results from an investigation, they try to make a claim. They base their claim on what their evidence shows. They also use what they already know to make their claim. They explain why their claim is valid. The purpose of a science explanation is to help others understand the following:

- what was learned from a set of investigations
- why the scientists reached this conclusion

Later, other scientists will use these explanations to help them explain other phenomena. The explanations will also help them predict what will happen in other situations.

You will do the same thing now. Your claim will be the trend you found in your investigations. You will use data you collected, the observations you made, and science knowledge you have read to create a good explanation. This will help you decide whether your claim is valid. You will be reporting the results of the investigation to your classmates. With a good explanation that matches your claim, you can convince them that your claim is valid.

Because your understanding of the science is not complete, you may not be able to fully explain your results. But you will use what you have read to come up with your best explanation. Scientists finding out about new things do the same thing. When they only partly understand something, it is impossible for them to form a “perfect” explanation. They do the best they can based on what they understand.

As scientists learn more, they make their explanations better. This is what you will do now and what you will be doing throughout *PBIS*. You will explain your results the best you can based on what you know now. Then, after you learn more, you will make your explanations better.



Be a Scientist

What Do Explanations Look Like?

Making claims and providing explanations are important parts of what scientists do. An explanation is made up of three parts:

- **Claim** – a statement of what you understand or a conclusion that you have reached from an investigation or set of investigations
- **Evidence** – data collected during investigations and trends in that data
- **Science knowledge** – knowledge about how things work. You may have learned this through reading, talking to an expert, discussion, or other experiences.

An explanation is a statement that connects the claim to the evidence and science knowledge in a logical way. A good explanation is provided in a way that can convince somebody that the claim is valid.

For example, suppose you live in a city in the USA that gets cold and has snow in the winter. It is fall. You see a lot of birds flying past your home. You wonder why so many birds are flying by. You have learned that many birds cannot live in cold places. They fly to warm places (usually south) to spend the winter. You wonder if these birds are flying by your home on their way to a warmer place. You take out your compass and observe that the direction they are flying is south. You conclude that the birds are flying past your home to a warmer place where they will spend the winter. Look at how you can form an explanation.

Your claim: The birds flying past my house are flying south for the winter.

Your evidence: The birds are flying in a southern direction. (You've observed and measured that using a compass.)

Your science knowledge: Birds that can't live in cold weather fly to warm climates and stay there for the winter.

Your explanation (for why there are so many birds flying south past your house): The birds are flying south to find a warmer place to spend the winter.

An explanation is what makes a claim different from an opinion. When you create an explanation, you use evidence and science knowledge to back up your claim. Then people know your claim is not simply something you think. It is something you've spent time investigating. You have found out things that show your claim is likely to be correct.

evidence: data collected during investigations and trends in that data.

science knowledge: knowledge about how things work gathered from reading or research, or discussion that helps you understand why a claim is true.