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I Can Use the Identify and Interpret (I²) Strategy

Have you ever looked at a graph or figure and felt overwhelmed by it? Often there is a lot of information on graphs and in figures. The Identify and Interpret (I²) strategy helps you make sense of graphs, figures, sketches, and other ways to represent data. This strategy helps you break down the information into smaller parts. To do this, you first *identify* what you see in the graph or figure. Then you *interpret* each of those observations by deciding what they mean.
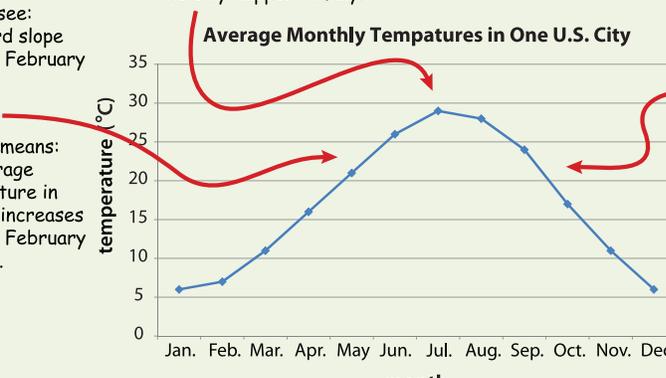
Once you have determined what the smaller parts of the graph or figure mean, you are ready to put all the information together. To do this, you write a *caption*. You have probably seen captions under figures in textbooks or magazines. Captions are a summary of the information in the graph or figure. They are written in complete sentences. Captions help you show your understanding of the material you are studying.
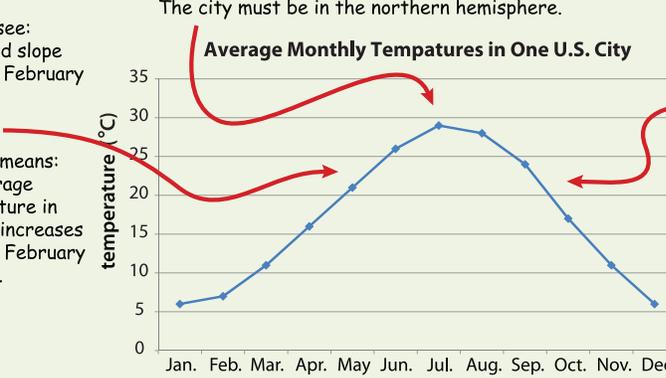
To help you understand how to use the I² strategy, look at the following example. This example will help you make sense of a graph. This graph shows the average monthly temperatures in one US city.

I² step	Example
Step 1: Identify ("What I see" comments) ■ Identify any changes, trends, or differences you see in the graph or figure. ■ Draw arrows and write a "What I see" comment for each arrow. ■ Be concise in your comments. These should be just what you can observe. ■ Do not try to explain the meaning at this point.	 For this example, there are arrows drawn that point to the two trends and the change. Notice that the arrows point to the general upward and downward trends, not to each data point. A "What I see" comment describes what each arrow points to on the graph.

Engage Explore Explain Elaborate Evaluate

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I² step	Example
Step 2: Interpret ("What it means" comments) ■ Interpret the meaning of each "What I see" comment by writing a "What it means" comment. ■ Do not try to interpret the whole graph or figure.	What I see: a peak in July What it means: the hottest average temperatures in the city happen in July. What I see: an upward slope between February and July What it means: The average temperature in the city increases between February and July. **Average Monthly Tempatures in One U.S. City** What I see: a downward slope between July and December What it means: The average temperature in the city decreases between July and December. In this example, "What it means" comments were added to each "What I see" comment. The "What it means" comments explain the changes, trends, and differences that were identified in Step 1.

I² step	Example
Step 3: Caption ■ Write a caption for the graph or figure. ■ Start with a topic sentence that describes what the graph or figure shows. ■ Then join each "What I see" comment with its "What it means" comment to make a sentence. ■ Build a coherent paragraph out of your sentences.	What I see: a peak in July What it means: The hottest average temperatures in the city happen in July. The city must be in the northern hemisphere. What I see: an upward slope between February and July What it means: The average temperature in the city increases between February and July. **Average Monthly Tempatures in One U.S. City** What I see: a downward slope between July and December What it means: The average temperature in the city decreases between July and December. This graph shows the average temperature in a city over a year. There is an upward slope from February to July, showing that there is an increase in the average temperature during these months. There is a downward slope from July to December, which means the average temperature decreases during this time. There is a peak in July, which shows that the hottest average temperature in the city happens in July. The peak in July also means that the city must be in the Northern Hemisphere. In this example, the first sentence of the caption describes what the graph shows. Then each "What I see" comment was combined with its "What it means" comment to form complete sentences. Those sentences make up a paragraph that describes each part of the graph.

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I Can Use the Identify and Interpret (I^2) Strategy
Teacher

Students can become overwhelmed when they try to interpret graphs, figures, or data tables. The Identify and Interpret (I^2) strategy is a way to help students make sense of the information by breaking it down into smaller parts.

In the I^2 strategy, students first *identify* changes, trends, or differences. They draw an arrow to each observation and then write a "What I see" (WIS) comment. These comments should simply be what the student observes, such as a positive slope on a graph or increasing numbers in a data table. After students have made all their observations and written their WIS comments, they should *interpret* the meaning of their observations by writing a "What it means" (WIM) comment for each. Once students have mastered WIS and WIM comments, ask them to create a caption for the graph, figure, or table. A caption is a summary of all the information and helps show students' understanding.

To use the I^2 strategy, you should have students place the graph, figure, or table that they are interpreting into their science notebooks. They should then draw the arrows and write their comments on and around the image. This helps them make the connections between the graphical information and their ideas. They should write the caption on the same page to help remind them of the interpretation.

Help students with page management as you use the strategy. Remind them to leave plenty of room around the graph, figure, or table so they can write their WIS and WIM comments. Also make sure they have room below the graph or figure to write their captions.

When you first begin using this strategy, model it for students. They can benefit greatly from watching you do a "think-aloud" as you complete the strategy on a graph, figure, or table. In the beginning, only ask students to complete the WIS and WIM comments without writing a caption. They will likely need help understanding what they should be looking for on the graph. Some students do not add enough arrows and WIS comments to interpret all the information. Other students try to add as many arrows and WIS comments as possible. These students soon find that they cannot interpret the meaning of some of their WIS comments. For example, if they identify that a graph is printed in black ink, they will discover that they cannot assign meaning to this WIS comment. This stage helps students begin to filter their numerous observations and only identify those that are significant to the graph, figure, or table.

Once students have become proficient at writing WIS and WIM comments, ask them to add a caption. Some students will find it repetitive since they are joining the WIS and WIM comments to create most of their captions; however, help them realize that the ability to create a coherent paragraph that interprets all parts of a graph, figure, or table is an important skill in science and other subjects. Later, when students have had a great deal of practice with this strategy, the ultimate goal should be for them to write a caption without having to list their WIS and WIM comments. Eventually, these comments become a habit of mind, and students should be able to notice all the pieces of a graph or figure to come up with a complete interpretation. Developing these habits of mind to identify and interpret data in many forms is a skill that will benefit students in all subjects, in their jobs as they get older, and in becoming a scientifically literate citizen.