Gain Attention/Interest:
Everyone talks about self-esteem. We hear a lot about making sure you don’t lower someone’s self-esteem, or about doing things that will raise a person’s self-esteem.

Think & Write #1
What exactly is self-esteem and what does it do for us?
Have students write their thoughts on self-esteem. If they struggle with writing general ideas, you may want to suggest they write about what self-esteem means to them personally or to someone they know.

How can we define self-esteem? (Solicit suggestions. Work toward something along the lines of: a positive personal evaluation of the self.)

Can anyone give examples of any celebrities who might have high self-esteem? (Solicit responses.)

What do you think makes these people have high self-esteem?
Example: Many people would say Tiger Woods has high self-esteem. Why do you think that is? (Solicit responses. Look for examples, such as: him being successful, has a lot of fans, is good at what he does, etc.)
An interesting question scientists study is whether high self-esteem is the result of doing well at things and being successful, or if it is the other way around. That is, does being successful lead to high self-esteem, or does having high self-esteem and feeling good about oneself lead to success? Does just having high self-esteem lead a person to perform better? Example: Does Tiger Woods's great skill at golf cause him to have high self-esteem or does his high self-esteem make him good at golf?

If having high self-esteem causes people to perform better, what could this mean for the rest of us? (Solicit ideas. Look for: If high self-esteem leads to success, then this would imply that people who aren’t successful must not have high enough self-esteem. Or, that if we want to be successful, we should try to raise our self-esteem).

This is a tough question. If we want to find answers we can apply to other people, not just Tiger Woods, we have to do something more than just ask him or his parents which came first. We have to study self-esteem scientifically.

Ask: What is Science?
Science is more than what you do in biology or chemistry class. Science looks at a question from many different viewpoints and tries to find out which viewpoint best describes a specific situation. A nonscientist might just look for the first “good” answer that comes along. But it’s important to know that the first explanation or even the most popular explanation is not always the correct one.

Example: Virtually everyone, even the smartest people, thought the world was flat for hundreds of years.

Next, after generating a hypothesis (deciding which answer they are going to test), scientists decide on a way to assess, or figure out, if their guess is right. To accomplish this, scientists use the method of proof by disproof. In this method, scientists try to disprove their hypothesis. At first this may not make much sense: Why would people make a guess at a right answer, then try to prove that it is wrong? Simple. If they try as hard as they can to disprove something and fail, then they have a lot of support that their answer is correct.
Before we try to answer our question, let’s make sure we are all thinking about the same thing. Making sure everyone knows exactly what we are talking about is essential to science. If we aren’t clear on our definitions from the beginning, different people could be thinking about different things. For example, think of the word “hot.” One of you could be thinking about a hot day of 90 degrees while another could be thinking about a hot oven of 400 degrees. Still another person could be thinking about a hot fire that is over 1000 degrees! However, if we clearly define our terms from the beginning, this problem can be avoided. In addition to defining all terms being used, scientists also have to clearly state the purpose of their research. There are many different aspects of the problem, but we can focus only on one at a time. Today we will discuss the relationship between self-esteem and success.

**Define the Problem: See Many Sides**

Before we try to answer our question, let’s make sure we are all thinking about the same thing. Making sure everyone knows exactly what we are talking about is essential to science. If we aren’t clear on our definitions from the beginning, different people could be thinking about different things. For example, think of the word “hot.” One of you could be thinking about a hot day of 90 degrees while another could be thinking about a hot oven of 400 degrees. Still another person could be thinking about a hot fire that is over 1000 degrees! However, if we clearly define our terms from the beginning, this problem can be avoided. In addition to defining all terms being used, scientists also have to clearly state the purpose of their research. There are many different aspects of the problem, but we can focus only on one at a time. Today we will discuss the relationship between self-esteem and success.

**Think & Write #2**

Have students form a hypothesis about the relationship between self-esteem and success. Does one lead to the other? Are they related at all? What support do students have for their hypothesis?
Below are some possible ways to think about self-esteem:

Does success (e.g., doing well in school) cause a person to develop high self-esteem?

Does having high self-esteem cause people to be successful (e.g., do better in school)?

Should we even be worrying about self-esteem? Does it really exist, or did some people just make it up? If time permits, or if you think it would be relevant/interesting to your class, discuss the Asian/collectivist culture focus on the group versus the individual. If the group is considered more important than the individual is, then self-esteem is not emphasized.

Can you think of any **counter-examples** for the above statements? A counter-example is something that offers evidence showing that a particular statement is not always true (e.g., the 2004 World Series is a counter-example to the statement that the Boston Red Sox never win the World Series).

Differents groups of people see self-esteem in different ways.

**Males and females.** Think of your friends. Do your male friends and female friends think about self-esteem in the same way? Do they base it on the same things (e.g., does having the right clothes, the right friends, or being good at sports influence the self-esteem of males and females in the same way)?

**Parents.** Parents could see self-esteem as a way their kids can get into college. If their children have high self-esteem, they’ll do well in school and in life.

**Youth.** Youth may see their self-esteem in different ways depending on how well they do in school, or on whether or not they are teased or bullied.

**Psychologists.** Psychologists might view self-esteem as a fragile, ever-changing thing. Psychologists conduct research to study self-esteem. Psychologists attend four-year colleges and graduate school.

**Motivational Speaker.** Motivational speakers try to raise the self-esteem of audience members. Though they have no mandatory formal training, motivational speakers must be fluent public speakers and it can take years of practice to become successful.
Distinguish Fact From Opinion: 
Learn What Constitutes Scientific Evidence

As we discussed earlier, the kind of information used as evidence is very important. Additionally, the source of the information is very important.

Fact Versus Opinion: What Constitutes Evidence?

The commercial is an example of an opinion, and a biased one at that. An advertisement is not going to say the food there is bad; it’s going to say things that will support its product. In science, we want facts, not opinions, and especially not biased opinions. Sometimes facts are difficult to find, and sometimes the only difference between fact and opinion is how a person gathers information.

Example: Source Bias

Say you see a TV commercial for a new Chinese restaurant. It tells you the food is great and that everyone who tries it loves it. Then you ask some of your friends who love Chinese food if they want to go, but they say they tried the place, it serves terrible food, and you shouldn’t go there. Whom should you believe? The restaurant has a bias toward promoting itself; it would never say its food was bad.

Example: Gathering facts versus opinions

Approaching a group of people at the mall and asking them, “What do you think is the most popular sport?” is an example of soliciting an opinion. Collecting data on sporting events with the highest TV ratings and attendance would be an example of gathering facts.

Which do you think are examples of evidence?

After asking every student on the honor roll (students who get good grades), “Do you have high self-esteem?” I claim that good grades lead to high self-esteem, since most of the students I polled replied “yes.” You can’t claim that good grades lead to high self-esteem based on this example because it cannot be determined which came first, the high self-esteem of the students or the students getting good grades.
To see if success influences self-esteem, you must, for example, measure the self-esteem of soccer players after each soccer match. Then, you must compare their self-esteem after a win to their self-esteem after a loss. This is a more scientific method of gathering evidence. If you find a difference in self-esteem using this method, you know that the success (or non-success) came before the self-esteem.

**Weigh Evidence and Make Decisions**

To find out how things work, scientists use special methods or techniques when investigating a question and when weighing the evidence. In the case of our self-esteem question, scientists could have a group of participants (people who volunteer to work with the scientists) take a test that measures self-esteem by asking a series of questions. Then, scientists could split the participants into two groups: one group being the half with higher self-esteem, and the other group the half with lower self-esteem.

After forming the two groups, the scientists could have them each complete a series of challenging tasks to see which group works on the task the longest, and whether they eventually succeed at the task.

What kind of challenging tasks could scientists give the two groups? *(Solicit answers.)* Examples: puzzles, word games, math problems, riddles.

Many scientists have done such experiments over the past few decades. Recently, some researchers went through these experiments to review the findings. After looking at all the research, they concluded that self-esteem is developed over time and depends on how well a person does on a lot of things. Being good at one particular thing does not necessarily give someone high self-esteem. Self-esteem can make a person try harder, or be more persistent after she/he fails the first time, but it does not necessarily cause good performance. Interestingly, research has also shown that the one thing that is fairly strongly linked to high self-esteem is happiness. People with high self-esteem report being happier than those with low self-esteem. However, the most important finding was that self-esteem was not related to improved general performance. In other words, raising self-esteem did NOT lead to people doing better at things. This finding is the opposite of many people’s long-held beliefs.
A non-scientist could look at this information and still believe that raising self-esteem can make people perform better. What would a scientist think? (Solicit responses.) As long as they can’t find any flaws with the evidence, scientists follow the data, even if the results are surprising. The data are facts. What they expected (even if they are scientists) is just an opinion.

Think & Write #3

**How about now?**

Now that you’ve heard how scientists define and measure self-esteem, what do you think? Compare your thoughts now to your thoughts from Think & Write 1.

**Move From Science to Society**

Now that we have some scientific findings about self-esteem, what do we do? Simply knowing isn’t enough; we need to do something to apply it to our lives. Let’s consider the many programs offered by schools across the country that are designed to increase students’ self-esteem. What do you think about the programs now that you have learned the science behind self-esteem? Are they worth the money and the time spent? What information would we want school boards to have the next time they are considering sponsoring a self-esteem training program at school?

**Revisit, Review, Reflect, and Re-evaluate**

Science is an ongoing process. If scientists simply asked a question, answered it, then moved on, we wouldn’t have the research we have today about self-esteem. To avoid mistakenly sticking with invalid answers, scientists constantly revisit old questions, review previous solutions, and reflect on how research might be improved. As recent research has shown with self-esteem, re-evaluating old information can change the direction of research and lead to new conclusions.

Think & Write #4

**What’s next?**

Have students write their thoughts about the direction they think scientists (and other professionals) should take in the future. Should people focus on ways to improve self-esteem? What other questions about self-esteem need to be answered?
Discussion Questions

1. If one of your friends has low self-esteem, does that mean that he/she will always have low self-esteem?

2. Should parents/teachers do everything they possibly can to make sure everyone has the highest self-esteem possible?

3. To achieve this, should they compliment everyone on everything they do? What would happen if they did?

4. Does self-esteem affect all people the same? Might it be the case that some groups of people are influenced by self-esteem differently from other groups?

Homework Questions

1. Self-esteem can often change over time. Ask a parent, or someone else who is older, about their self-esteem when they were your age. Be sure to define self-esteem for them, so you are talking about the same thing.

2. Pretend you are a scientist and design your own experiment to test something related to self-esteem.

3. Bring in three examples of claims in which the source has a bias. Explain why the sources are biased.
1. Scientists think it is important to define all terms and the problem they are working on.

   Yes  No  Sometimes

2. Opinions are important to scientists.

   Yes  No  Sometimes

3. Scientists seek as much support for their hypotheses as possible. Only once they find enough support can they claim their hypotheses are correct.

   Yes  No  Sometimes
Quiz Questions

Version B

1. This lesson discusses counter-examples. What is a counter-example?

2. Give an example of a biased source.

3. Which is more important to scientists, an opinion or a fact? Why?
1. Why do scientists think it is important to define a specific question and all relevant terms when studying a problem?

2. Explain the method of proof by disproof. How does it work?

3. What is a biased source? Give an example.