



## Financial Algebra

### *Supplemental lesson plan for Financial Algebra*

Introduction: One of the main reasons that people invest in solar power is that it will help them save money. In this lesson students will write equations for calculating the cost of installing and using solar panels, how long it will take you to pay for the cost of installation, and the total savings over time.

Writing equations: Suppose that the cost of installing panels on a 2500 square foot house is \$15,000, and you estimate that you will save \$100/month on your power bill. In the simplest analysis, you can easily figure out how long it will take you to save enough on your monthly bill to pay for the cost of installing solar panels:

$$\$15,000 \text{ divided by } \$100/\text{month} = 150 \text{ months, or } 12.5 \text{ years.}$$

Now let's add some more data to our calculations. Suppose that it costs \$200/year to operate and maintain your solar panels (cleaning, repairs, electrical maintenance). Have your students create a chart showing the cost of solar panels over 5 years. Write an equation for these costs over time (t) in years:

$$\$15,000 + \$200t$$

Since you save \$100/month, or \$1200/year, your new break-even point becomes

$$\$15,000 + \$200t = \$1200t$$

$$T = 15$$

So, it will take you 15 years to pay for your installation with savings from using solar power. If your solar panels last for 30 years, how much money will you save over the life of the installation?

### Additional Investigation:

Suppose that the cost of electricity is going up every year, increasing your savings by 4% per year, but the cost of producing electricity from your panels remains constant. Can you incorporate these additional savings into your equation?

Suppose that you had to borrow the money to install the solar panels at 6% interest. How would this affect your cost equation?