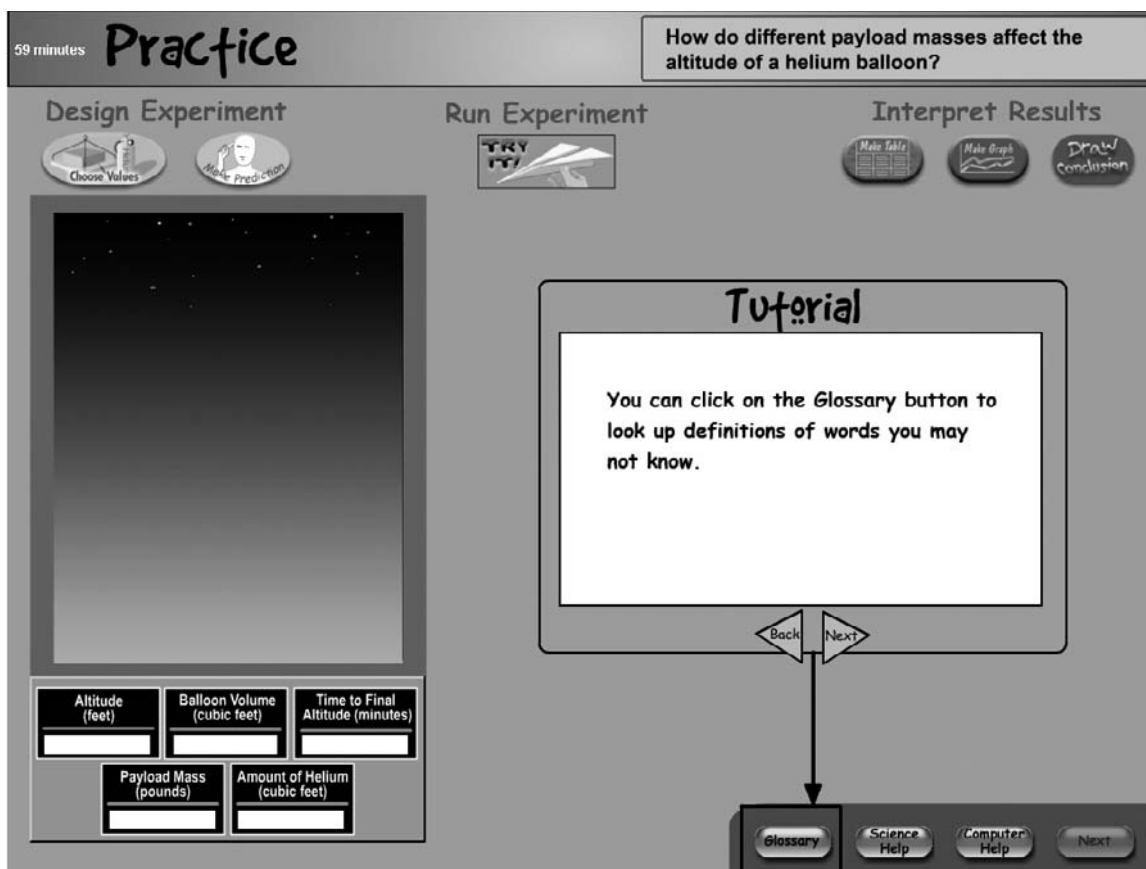


Figure E-22. TRE Simulation tutorial screen 5 showing the Glossary tool button, grade 8: 2003



NOTE: TRE = Technology-Rich Environments.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Problem Solving in Technology-Rich Environments Study.

Figure E-23. TRE Simulation tutorial screen 6 showing the Science and Computer Help tool buttons, grade 8: 2003



NOTE: TRE = Technology-Rich Environments.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Problem Solving in Technology-Rich Environments Study.

Figure E-24. TRE Simulation tutorial screen 7 showing the Choose Values (for experiments) button, grade 8: 2003

58 minutes **Practice**

How do different payload masses affect the altitude of a helium balloon?

Design Experiment Run Experiment Interpret Results

Choose Values Make Prediction TRY IT! Make Table Make Graph Draw Conclusion

Tutorial

To design an experiment, you need to choose values. Click on that button now.

Back Next

Altitude (feet) Balloon Volume (cubic feet) Time to Final Altitude (minutes)

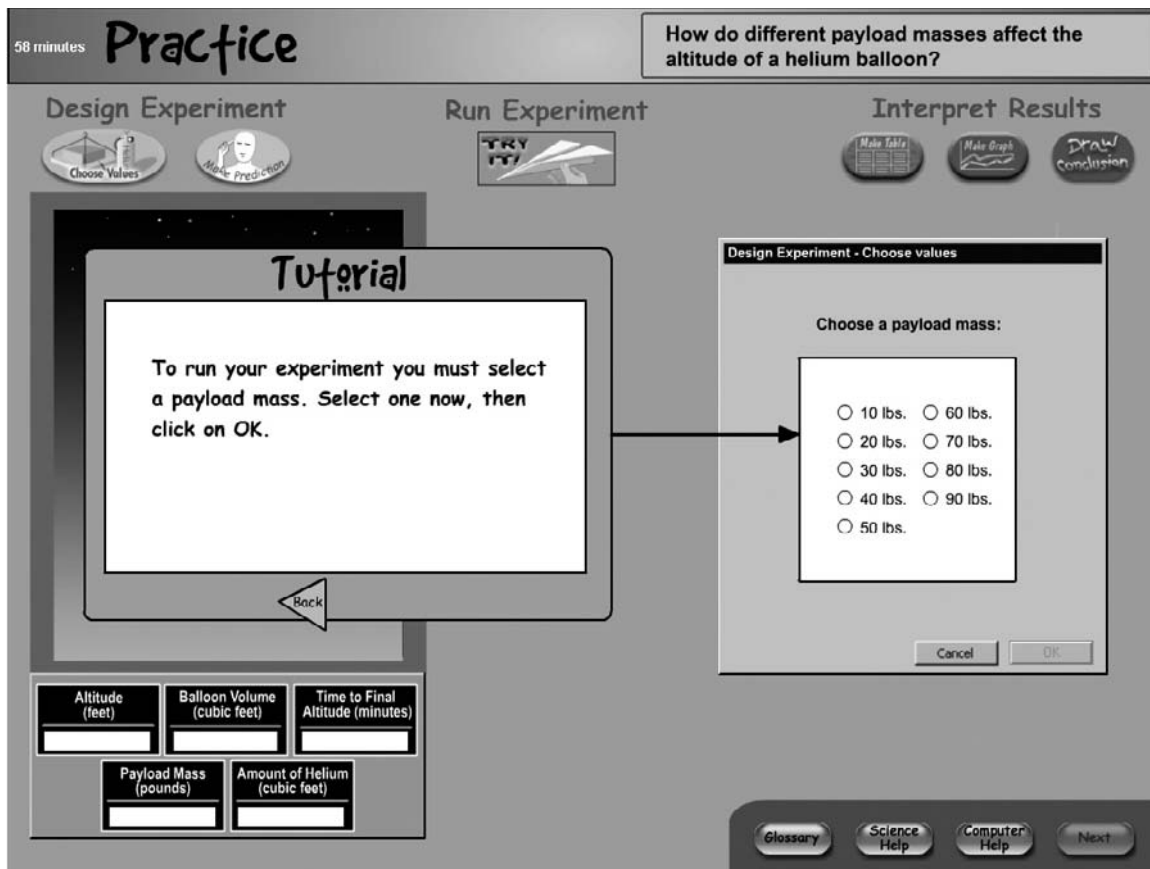
Payload Mass (pounds) Amount of Helium (cubic feet)

Glossary Science Help Computer Help Next

NOTE: TRE = Technology-Rich Environments.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Problem Solving in Technology-Rich Environments Study.

Figure E-25. TRE Simulation tutorial screen 8 showing the payload mass menu, grade 8: 2003



NOTE: TRE = Technology-Rich Environments.

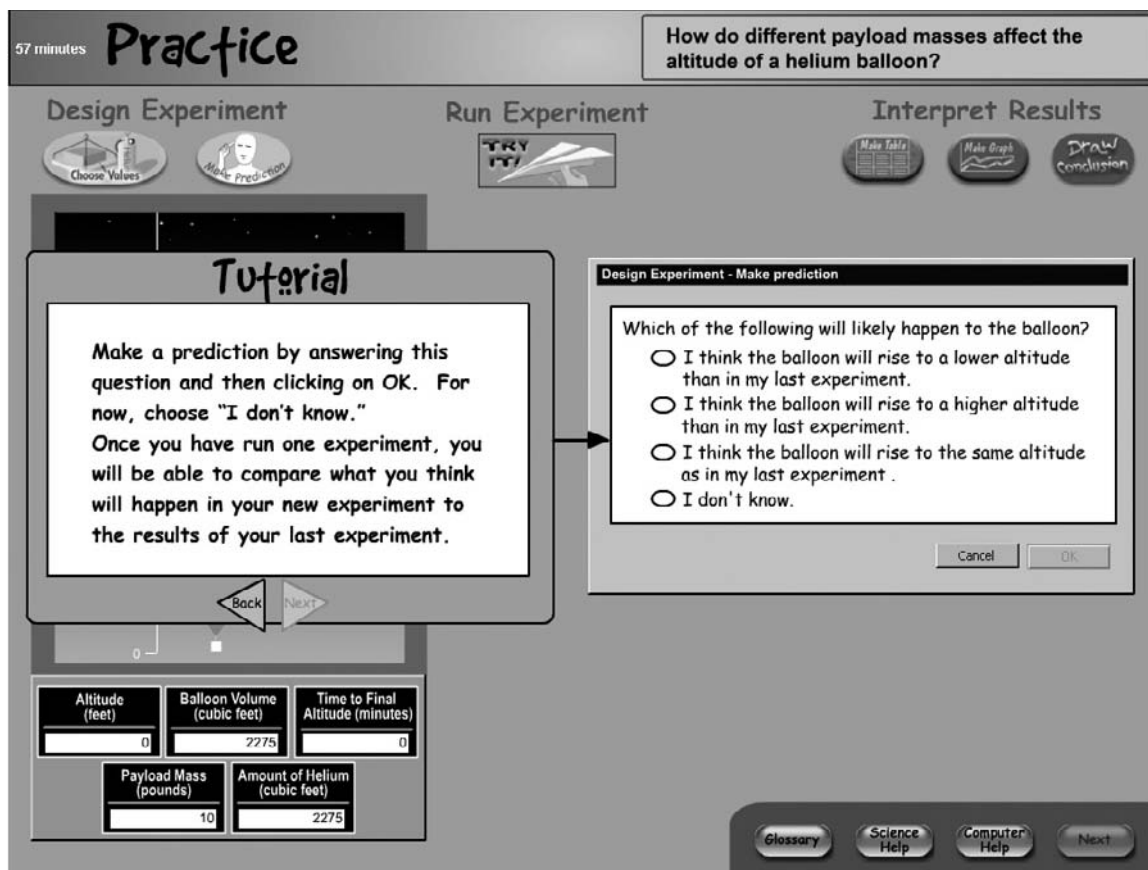
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Problem Solving in Technology-Rich Environments Study.

Figure E-26. TRE Simulation tutorial screen 9 showing the Make Prediction button, grade 8: 2003

NOTE: TRE = Technology-Rich Environments.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Problem Solving in Technology-Rich Environments Study.

Figure E-27. TRE Simulation tutorial screen 10 showing the Make Prediction question and response choices, grade 8: 2003



NOTE: TRE = Technology-Rich Environments.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Problem Solving in Technology-Rich Environments Study.

Figure E-28. TRE Simulation tutorial screen 11 showing the Try It button for running an experiment, grade 8: 2003

57 minutes **Practice**

How do different payload masses affect the altitude of a helium balloon?

Design Experiment

Choose Values Make Prediction

10000
0

Altitude (feet) 0
Balloon Volume (cubic feet) 2275
Time to Final Altitude (minutes) 0
Payload Mass (pounds) 10
Amount of Helium (cubic feet) 2275

Run Experiment

TRY IT

Interpret Results

Make Table Make Graph Draw conclusion

Tutorial

To run your experiment, click on TRY IT. Watch the balloon and the changing displays on the instrument panel underneath. Compare what happens to what you predicted would happen.

Click on TRY IT now.

Back Next

Glossary Science Help Computer Help Next

NOTE: TRE = Technology-Rich Environments.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Problem Solving in Technology-Rich Environments Study.

Figure E-29. TRE Simulation tutorial screen 12 showing the instrument panel in detail, grade 8: 2003

Practice 57 minutes

How do different payload masses affect the altitude of a helium balloon?

Design Experiment (Choose Values, Make Prediction)

Run Experiment (TRY IT)

Interpret Results (Make Table, Make Graph, Draw Conclusion)

Tutorial

Notice that the instrument panel shows the payload mass you chose and the amount of helium in the balloon.

Back Next

Altitude (feet)	Balloon Volume (cubic feet)	Time to Final Altitude (minutes)
36211	3083	36
Payload Mass (pounds)	Amount of Helium (cubic feet)	
10	2275	

Glossary Science Help Computer Help Next

NOTE: TRE = Technology-Rich Environments.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Problem Solving in Technology-Rich Environments Study.

Figure E-30. TRE Simulation tutorial screen 13 showing the instrument panel in detail, grade 8: 2003

Practice 56 minutes

How do different payload masses affect the altitude of a helium balloon?

Design Experiment (Choose Values, Make Prediction) | **Run Experiment** (TRY IT) | **Interpret Results** (Make Table, Make Graph, Draw conclusion)

Tutorial

The instrument panel also shows the results of your experiment including:

- the altitude reached by the balloon,
- the final volume of the balloon,
- and the time the balloon took to reach its final altitude.

Instrument Panel Data:

Altitude (feet)	Balloon Volume (cubic feet)	Time to Final Altitude (minutes)
36211	3083	36
Payload Mass (pounds)	Amount of Helium (cubic feet)	
10	2275	

Navigation: Back, Next, Glossary, Science Help, Computer Help, Next

NOTE: TRE = Technology-Rich Environments.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Problem Solving in Technology-Rich Environments Study.

Figure E-31. TRE Simulation tutorial screen 14 showing the buttons for making tables and graphs, grade 8: 2003

56 minutes **Practice**

How do different payload masses affect the altitude of a helium balloon?

Design Experiment
 Choose Values Make Prediction

Run Experiment
 TRY IT

Interpret Results
 Make Table Make Graph Draw conclusion

Tutorial

You can organize the results of your experiments at any time by clicking on the MAKE TABLE and MAKE GRAPH buttons.

Back Next

Altitude (feet) 40000 30000

Balloon Volume (cubic feet)

Time to Final Altitude (minutes)

Payload Mass (pounds)

Amount of Helium (cubic feet)

Glossary Science Help Computer Help Next

NOTE: TRE = Technology-Rich Environments.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Problem Solving in Technology-Rich Environments Study.

Figure E-32. TRE Simulation tutorial screen 15 showing the button for drawing conclusions, grade 8: 2003

56 minutes **Practice**

How do different payload masses affect the altitude of a helium balloon?

Design Experiment
Choose Values Make Prediction

Run Experiment
TRY IT!

Interpret Results
Make Table Make Graph **DRAW CONCLUSION**

Tutorial

When you have collected enough data to solve the problem, you can click on the **DRAW CONCLUSION** button.

Back Next

Altitude (feet) 36211
Balloon Volume (cubic feet) 3083
Time to Final Altitude (minutes) 36
Payload Mass (pounds) 10
Amount of Helium (cubic feet) 2275

Glossary Science Help Computer Help Next

NOTE: TRE = Technology-Rich Environments.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Problem Solving in Technology-Rich Environments Study.

Figure E-33. TRE Simulation tutorial screen 16 showing the problem to be solved, grade 8: 2003

The screenshot shows a simulation interface with the following components:

- Header:** "56 minutes Practice" and a question box: "How do different payload masses affect the altitude of a helium balloon?"
- Design Experiment:** Includes "Choose Values" and "Make Prediction" buttons. A graph shows altitude (feet) on the y-axis (30000 to 40000) and a balloon icon.
- Run Experiment:** Includes a "TRY IT" button.
- Interpret Results:** Includes "Make Table", "Make Graph", and "Draw Conclusion" buttons.
- Data Table:**

Altitude (feet)	Balloon Volume (cubic feet)	Time to Final Altitude (minutes)
36211	3083	36
Payload Mass (pounds)	Amount of Helium (cubic feet)	
10	2275	
- End of Tutorial:** A large box containing the text: "End of Tutorial. You are now ready to solve the problem on your own." Below it are "Back" and "Next" navigation buttons.
- Footer:** "Glossary", "Science Help", "Computer Help", and "Next" buttons.

NOTE: TRE = Technology-Rich Environments.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Problem Solving in Technology-Rich Environments Study.

Figure E-34. TRE Simulation tutorial screen 17 showing entry into the Simulation scenario, grade 8: 2003

55 minutes **Practice**

How do different payload masses affect the altitude of a helium balloon?

Design Experiment **Run Experiment** **Interpret Results**

Choose Values Make Prediction TRY IT Make Table Make Graph Draw Conclusion

Altitude (feet) Balloon Volume (cubic feet) Time to Final Altitude (minutes)

36211 3083 36

Payload Mass (pounds) Amount of Helium (cubic feet)

10 2275

End of Tutorial

You are now ready to solve the problem on your own.

If you are confused, click on Science Help, Computer Help, or Glossary.

As you work, think carefully about how many experiments you need to do to solve the problem.

Click "Next" to read the task directions for Problem 1.

Back Next

Glossary Science Help Computer Help Next

NOTE: TRE = Technology-Rich Environments.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Problem Solving in Technology-Rich Environments Study.