



TRAINING MATERIAL

Powers of Ten Game

Materials

- “Sizing Things Down” playing cards
- Orders of Magnitude sheet

Graphic files can be downloaded from www.nisenet.org.

Notes to the presenter

Here are some hints for learning and playing the game with visitors:

- After each group of visitors, leave the last hand played out on the table. The cards and pictures will attract the attention of another group.
- Use the last hand’s cards to explain the game, and then deal a new hand. Add more rows if you have many players. With fewer than four players, three rows are enough. With more players, additional rows give everyone more chances to play. One row per player is a good guideline.
- After each play, say the size comparison aloud: “A cruise ship is bigger than a breadbox,” or “DNA is smaller than Jupiter.” (Ask visitors to reconsider if they make an invalid move.)

Staff training resources

Video: *Powers of Ten*, vimeo.com/album/3636993

Credits and Rights

This activity was adapted from *Sizing Things Down*, developed by the Oregon Museum of Science and Industry for the NISE Network. It is a modified version of the NISE Network’s educational product *Exploring Size—Powers of Ten* available on www.nisenet.org. Photo of computer chip, istock.com/ all rights reserved.



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Tips for leading hands-on science activities

Greet your guests

Say “hello,” make eye contact, and smile. People will come over if you look welcoming, available, and friendly.

Let them do the activity

As much as possible, let your guests do the hands-on parts of the activity, and let them discover what happens. (If your activity has a surprise, don’t give it away!)

Encourage exploration

Provide positive feedback and assistance when people need it, but let them experiment and learn for themselves. Don’t insist people do things the “right” way—sometimes learning how something doesn’t work is just as valuable as learning how it does work.

Ask questions

Help people observe and think about the activity. Try to use questions that have more than one answer, such as: “What do you see happening?” “Why do you think that happened?” “What surprised you about what you saw?” “Does this remind you of anything you’ve seen before?”

Be a good listener

Be interested in what your guests tell you, and let their curiosity and responses drive your conversation forward.

Share what you know

Use clear, simple language. Focus on one main idea—you don’t need to explain everything at once! Keep the information basic for starters, and share more with interested learners.

Use examples from everyday life

Familiar examples can help explain abstract concepts. Be aware of different abilities, keeping in mind that children do not have the same skills or vocabulary as adults.

Offer positive responses

If people haven’t quite grasped a concept, you might say, “That’s a good guess,” or “Very close, any other ideas?” Never say, “No” or “Wrong.” You can offer hints or suggestions for things to think about or watch carefully.

Share accurate information

If you aren’t sure about something, it’s ok to say, “I don’t know. That’s a great question!” Suggest ways that people can learn more, by trying another activity or looking up information at the library or online.

Remain positive

Maintain an inviting facial expression, positive tone, and open body language throughout the interaction.

Thank your guests

As your interaction ends, suggest other activities that you think your guests might enjoy.

Have fun!

A positive experience will encourage learning.