



TRAINING MATERIAL

# Mystery Shapes

## Materials

- Canvas bag
- Assorted small objects to hide in the bag
- “AFM” Image Sheet
- “Scanning Probe Microscope” cards
- Pencils

You can substitute a pillowcase or a cardboard box with holes cut in the sides for the small canvas bag.

## Notes to the presenter

You can find other mystery shapes for visitors to feel, in addition to those included in the activity.

Young children, individuals with limited dexterity, and low-vision visitors may prefer to describe what they feel rather than draw it.

While most visitors are enthusiastic about discovering the “mystery shapes” in the box, some may hesitate to put their hands inside. You can reassure them that there’s nothing scary or icky in the box!

## Safety

Some of the objects used in this activity could present a choke hazard to young children.

## Staff training resources

Video: *Mystery Shapes*, [vimeo.com/album/3636993](https://vimeo.com/album/3636993)

## Credits and Rights

This activity is a modified version of the NISE Network’s educational products *Exploring Tools—Mystery Shapes* and *DIY Nano Mystery Shapes*, available on [www.nisenet.org](http://www.nisenet.org). Photo of researcher using AFM by Charles Harrington Photography, Cornell Nanoscale Facility. Image of AFM tip by SecretDisc, Wikimedia Commons.



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# Tips for leading hands-on science activities

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## 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.