



# FACILITATOR GUIDE

## BUY IT, OR BETTER NOT?

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### DESCRIPTION

In this activity, participants explore some qualities of titanium dioxide nanoparticles in common household and food products.

### AUDIENCES

This activity is best suited for ages 10 and up.

### LEARNING OBJECTIVES

- Nanoscale titanium dioxide is a common additive in many products that we consume, rub into our skin, and use in our homes.
- Materials can act differently when they're nano-sized.
- Nanotechnologies have costs, risks, and benefits that affect our lives in ways we cannot always predict.

### MATERIALS

- Plastic viewer with titanium dioxide powder
- Brookite specimen
- Chewing gum containing  $\text{TiO}_2$
- Sunscreen containing  $\text{TiO}_2$
- Product cards and basket labels
- Three toy shopping baskets
- Three velcro dots to attach labels to baskets (buy it, think about it, better not)
- Activity guide
- Sign stand

### NOTES TO THE PRESENTER

**Activity flow:** First, set out the cards on the table. Ask participants whether they have ever used any of products pictured on the cards. Ask them to sort the products into two piles: products they have used and products they have not used.

Explain that all of the products have something in common: they all contain titanium dioxide ( $\text{TiO}_2$ ). Set aside the products that the participants have not used and focus the products they have used.

Next, invite participants to take a look at the viewer containing the titanium dioxide powder and the brookite specimen. Explain that titanium dioxide is a very common additive in many products that we consume, use on our skin, and use in our homes. It is derived from brookite and other minerals, such as anatase.

Now return to the cards for the products they have used/currently use. Discuss the purpose of titanium dioxide in those products. Explain that nanoparticles exist in many common products. Despite years of research, there is no conclusive evidence about potential health risks of titanium dioxide.

Explain that we need to consider benefits and risks of using products containing nanoparticles to become informed consumers. Discussion points may include:

- How titanium dioxide gets on your body and in your body matters.
- How much titanium dioxide gets into your body is important.
- How big or small the particles are makes a difference.
- Not all titanium dioxide particles behave in the same manner.
- One important aspect of smaller particles is that they can get to places larger ones can't. This doesn't mean that they are more likely to get into the body and do damage if they're ingested – but it does mean that we need to be more careful with how we use smaller particles compared to larger ones.
- When titanium dioxide nanoparticles wash off skin, they enter the environment, with unknown effects. The implications of nanoparticle pollution on the environment have not been sufficiently assessed.

After discussing the risks and benefits of the products, invite the participants to revisit their opinions about the products they use or have used and place them in the appropriate shopping basket.

**NOTE: It is very important that you establish that there are no right or wrong answers. This activity is designed to be an opportunity for participants to consider their personal values around the use of everyday products that contain nanoparticles of titanium dioxide.**

**Audiences:** Younger children and individuals with special needs may need assistance with some concepts in this activity.

**Safety:** Supervise young children to ensure they do not mouth any materials, as some materials may present choking hazards. **Do not open the plastic viewer containing titanium dioxide powder due to inhalation hazard.**

## CREDITS AND RIGHTS



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This activity was adapted from *Would You Buy that?*, developed by the Nanoscale Informal Science Education Network. Retrieved from [http://nisenet.org/sites/default/files/catalog/uploads/12062/wouldyoubuythat\\_lessonplan\\_06nov13.pdf](http://nisenet.org/sites/default/files/catalog/uploads/12062/wouldyoubuythat_lessonplan_06nov13.pdf)

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# CONVERSATION TIPS SCIENCE & SOCIETY

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## **Greet participants**

Say “hello,” make eye contact, and smile. Simply looking like you’re available and friendly will invite learners to interact with you.

## **Let participants do the activity**

As much as possible, let visitors do the activity themselves. Your role is to help them as needed.

## **Ask open-ended questions**

Help learners observe and think about the activity. Try to use questions that have more than one answer, such as: *Does this remind you of anything you’ve seen before?*

## **Support reflection and conversation**

Help learners reflect on the connections between science, engineering, and society. Let participants’ thoughts and interests guide your conversation, and let them form their own ideas and opinions. For the purpose of this learning experience, there are no right and wrong answers.

## **Offer positive and encouraging responses**

When learners have trouble articulating their thoughts, you might say, “That’s an interesting idea. Why do you think that?” or “Have you thought about...?” Offer them an opportunity to reflect further.

## **Be a good listener**

Be interested in what participants tell you, and let their curiosity and responses move the conversation forward.

## **Share accurate information**

You can provide additional information or a different perspective. If you aren’t sure about something, it’s ok to say, “I don’t know. That’s a great question!” Suggest looking for more information at the library or online.

## **Remain positive throughout the interaction**

Keep things upbeat and positive. Remember that nonverbal communication is important, too. Maintain an inviting face and body language.

## **Wrap up graciously**

Follow their cues, and recognize when they’re ready to move on. Thank them for participating, and suggest other activities they might enjoy. Even a brief interaction can have a big impact!

**HAVE FUN!** A positive experience will lead to learning.