GSK Science in the Summer™

In partnership with The Franklin Institute

GSK SCIENCE IN THE SUMMER™
BE AN ENGINEER ACTIVITY SUPPORT GUIDE

What is this program about?

The goal of the *Be an Engineer* program is to help children appreciate and feel confident about engineering and pursuing careers in engineering fields. It encourages children to:

- **Role-play engineering careers.** Imagination and role-play help children practice and identify with adult occupations. Each *Be an Engineer* activity is a story that invites children to take on the role of an engineer working on a real-world problem.
- **Think like an engineer.** Children practice key engineering skills like defining problems, designing and testing solutions, and collecting data.
- **Have fun.** Exciting, positive experiences with engineering help children feel more confident about doing engineering in the future.

How can you help?

Be an "engineering assistant!" Your role is to support children as they explore the engineering process. Encourage them to test their ideas, try new things, and learn from things that don't work. Help them connect their thoughts and actions during the activities with the work that real engineers do.

What to DO:

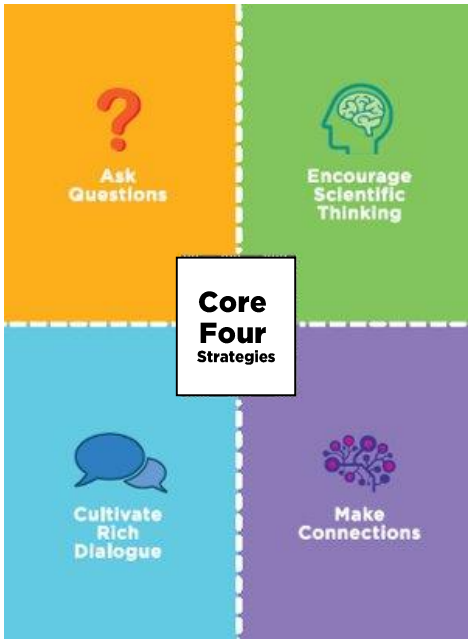
- **Use the Core Four Strategies** (listed below). These strategies encourage children to investigate ideas and build science and engineering skills.
- **Join in the role-play.** Refer to children as "engineers" and to group discussions as "team meetings" or "research reports." Connect children's ideas and designs back to the activity's story. For example: *Will the people on the hiking trail be able to walk on a bridge like yours? What else might it need to make it safe for them?*
- **Review the "Engineering Process" and "Think Like an Engineer"** pages at the beginning of the children's Lab Notebook. Look for and point out times during the activity when you notice children using the practices listed there.
- **Adapt to children's interests.** Allow children to change or extend the activities based on their ideas (if they are safe and reasonable). If a child wants to solve a problem in an unusual way or use a material different from the ones provided, encourage them to try it!
- **Encourage trying again and learning from failure.** Point out and celebrate examples of children's persistence and creativity, rather than just successful results.
- **Engage all children equitably**. If you're working with a group, ensure that all children feel welcomed and included in the activities. Learn children's names and use them

consistently. Intentionally choose children of different genders and backgrounds to answer questions or assist with tasks, especially those who are not always first to volunteer.

What to AVOID:

- **Step-by-step instructions.** Allow children the freedom to follow their own ideas. There is always more than one right way to solve an engineering problem!
- **Giving answers or "fixing" children's designs**. Children learn and remember best when they work through problems themselves. Even if you think a child's idea is likely to fail, encourage them to try it. Ask questions like "What did you notice?" and "What could you do differently this time?" to help them evaluate and make changes.
- **Long explanations of science concepts.** The goal of this program is for children to *do* science, not necessarily to learn specific facts or content. For example, it is more important to *experience* building an electrical circuit than to understand exactly what electricity is and how it works.

The Core Four Strategies



- **Ask questions** to help children share ideas, work through problems, or explain their thinking. Open-ended questions—questions with more than one possible answer—are especially helpful:
  What parts of your design are working well?
  What parts aren't working yet?
  How could you change it so it works better?
  What else could you try?

- **Encourage scientific thinking** by asking children to make observations, predict what will happen, or draw conclusions from their results:
  What do you notice about…?
  What do you think will happen if…?
  What does that tell you about your design?

- **Cultivate rich dialogue** by encouraging children to talk about their ideas and practice using science and engineering language.
  Tell me about your plan for your buzzer switch.
  That's an interesting prediction. What makes you think that?
  This person is having the same problem. Tell each other what you've tried so far.

- **Make connections** between the engineering activities and children's everyday experiences. Help them notice how their ideas and actions are like those of real engineers.
  Where have you seen or used something like this before?
  What devices do you have at home that turn on with a switch?
  What did you do today that was like what an engineer does?