

BEST PRACTICES FOR USING SIEMENS SCIENCE DAY ACTIVITIES & VIDEOS

The Siemens Science Day site is filled with dozens of hands-on activities designed to get your students excited about earth, life, and physical sciences. The activities are written for K-3 and 4-6 grade students and organized by science discipline (physical, life, or earth). New activities and monthly themed activities can be found grouped together on the website homepage.

Below you will find what features you can expect in every Siemens Science Day activity and best practices to help you effectively utilize the activities and videos with your students.

Anatomy of a Siemens Science Day Activity

In every activity, you will find the following consistent features:

- **Time frame:** An estimated amount of time to complete the activity, from warm up to wrap up.
- **Real-world science topics:** Science-related connections to the real world.
- **Objectives:** Main objective(s) for the activity.
- **Materials needed:** Materials for each phase of the activity.
- **Teacher preparation:** What teachers will need to do before beginning the activity.
- **National Standards connections:** A list of national math, technology, and science standards met by the activity.
- **Warm up:** A quick prompt to introduce students to the activity.
- **Step-by-step instructions:** Detailed instructions for completing the activity.
- **Wrap up:** The final step in the activity, often focusing on discussion, analysis, reflection, and explanation.
- **Extensions:** Ideas for extending the activity beyond the classroom.
- **Background Information:** Additional information about key concepts covered in the lesson and video.
- **Teacher and Student Handouts:** Reproducible Student Handouts to connect students to the activity accompanied by a Teacher Handout (answer key).
- **Video:** A short, high-interest video that relates to the activity topic (see below).

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Activities

Here are some ideas to help you effectively integrate the Siemens Science Day activities in your classroom.

- With dozens of standards-based, hands-on activities to choose from, you may have trouble deciding which to try first! There are several strategies that can help you. You may want to start with the specific discipline you are covering. If you are in a Life Science unit, the Life Science list of activities is a natural place to start. Another way you can choose which activities to try first is by looking at the national standards covered. Which ones fit your individual curricular needs? Still another way is to look at the amount of time suggested. Some activities take less than an hour while others take several days. Finally, it's always a good idea to think about the activities and topics that will be exciting, fun and meaningful for your students. All activities have been designed to get kids excited about science but children are likely to be more engaged in topics they find interesting. Of course, it doesn't hurt if you also get excited by the topics you pick!
- Activities are designed to meet curricular objectives and national standards for earth, life, and physical science so they will naturally fit into your math, science, or technology blocks.
- Activities are designed to be flexible. If the suggested amount of time is three hours and you only have one, simply take out a part of the activity or spread it over several days.
- You also have flexibility about where to start the lesson. You could start the lesson by showing the video, by reviewing the background information, or with the Warm-Up activity.
- As with any activity, make sure you review it completely before starting. All activities are consistent and turn-key but you will certainly benefit from going through all materials first. Have all materials ready to go and put your own special touch on the step-by-step instructions.
- The tagline of Siemens Science Day is “learning by doing” and that’s what students should do within every activity. When students lead the learning and get their hands dirty, it helps them learn the joys of science!
- Encourage students to ask, question, and probe. Elementary students have a natural curiosity, and that curiosity makes for a great scientist. Even if it means not finishing every step in the activity, take some time to explore the things that your students are curious about.
- Most activities have a component of group work and collaboration, just as real scientists do. Think about how to group your students most effectively. Some students work better with friends while others work better with those with similar learning styles. Some work better within a consistent group while others benefit from switching groups for each activity.
- Finally, remind your young scientists that science is often about learning from failure. It's okay to give something a try and not figure it out the first time. In fact, many of our greatest inventions and discoveries have come from failure!

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It's one thing to talk in science class about the damage and destruction that an earthquake could cause. It's another thing to see that destruction firsthand as students do in the video for the "Keep It Up" Siemens Science Day activity. Teachers all across the country are finding that well-chosen videos help students engage more deeply with subject matter, get more excited about learning, and recall information they've learned longer.

For these reasons and many others, teachers will find short, high-interest videos from the Discovery library embedded within each Siemens Science Day activity. The videos have been selected to capture student interest, meet the needs of visual learners, provide a real-world window into a science topic related to the activity, and take students places they may not otherwise be able to go. The videos are designed to be flexible; depending on your student population and time constraints, you can show the video before, during, or after the activity. Or you can do all three!

Videos

Using these videos can provide a springboard for effective student interaction and learning in several ways. Below are some general strategies and best practices to help you enhance the use of video in your classroom:

- Preview each video before showing to students. You will want to determine what is most appropriate and connects best to your individual classroom situation. These videos are short, but some parts may better match your objectives. When you preview, listen for unfamiliar vocabulary or anticipate questions that students may ask.
- Determine whether you will show the video before (as an introduction), during (as a reinforcement) or after (as an extension) the activity.
- Before showing the video to students, provide a focus for them. Give the students something specific to look or listen for, or ask them to predict or guess something before watching. This will help to focus their attention and encourage active viewing.
- Conduct pre- and post-viewing questions. Pre-viewing questions can check prior knowledge, set the stage for new learning, and introduce new vocabulary and concepts. Post-viewing questions should allow students to reinforce, review, apply, or extend what they've learned. After viewing, you can simply ask students to identify science-related concepts and how it connects to the activity.
- Help students interact while watching the video by asking questions throughout or encourage students to come up with their own questions.