



MACGILLIVRAY FREEMAN'S

DREAM BIG

INTEGRATING *DREAM BIG* INTO MUSEUM PROGRAMS

MAKE 2017 THE YEAR OF THE ENGINEER!

Dream Big offers a wide range of opportunities for museums and science centers to integrate the film and engineering content into exhibits, educational or public programs, and other year-round activities. Designed to appeal to different audiences, *Dream Big* programming works in a range of spaces and situations. All of these environments can be connected to and strengthened by the messages and stories in the *Dream Big* film.

IDEAS FOR PROGRAMMING

You probably already do some engineering and STEM programs, so *Dream Big* could contribute to your long-term programming in big ways:

- Engineering activities invite museum guests to use science content presented in exhibits and programs to create novel solutions.
- Activities build awareness of engineering as a field and potential profession.
- The engineering design process encourages creativity, collaboration, and persistence as guests learn from their failures and try over and over again.
- Educators are eager for quality engineering content that aligns with NGSS—like the *Dream Big* resources do.

DESIGN CHALLENGE EXHIBITS FOR MAKER/TINKER SPACES

Plans for three *Dream Big Design Challenge Exhibits* have been created to accompany the film. These exhibits demonstrate how engineers are building bridges, wind tunnels, or shake tables on a grand scale in the film, and then allow visitors to actually try their hand at building a suspension bridge or working with a wind tunnel or shake table! A full design manual will be provided to enable museums to build these design challenge exhibits on the exhibit floor, or the exhibits can easily be adapted for Maker/Tinker spaces. These are the three design challenge exhibits:

1. *Do it Yourself Wind Tunnel* explores the power of the wind.
2. *Seismic Shake Table* examines how to build structures to withstand earthquakes.
3. *Build a Cable-Stayed Bridge* investigates how the structure holds up roadways.

OTHER IDEAS FOR PROGRAMS IN MAKER/TINKER SPACES

You can integrate *Dream Big* programming into Maker/Tinker spaces by presenting a few sample challenges and by displaying visitor designs. Accompany these with open-ended questions that allow for divergent problems and solutions. Sample prompts could include:

- Design a building for your dream city.
- Design a vehicle for the year 3000. How does it move and how is it powered?
- Design a product for a special client: your pet! Think about what type of animal you would design for and what that animal might want most.

Encourage guests to use materials creatively to produce unique designs. Then display visitor work from both the open-ended and the challenge-based activities to inspire other guests. The display area could direct those who are interested in learning more about design and problem solving to the *Dream Big* film.

PERMANENT EXHIBIT CONNECTIONS

Brainstorm ways you can connect your permanent exhibits to *Dream Big* topics. If you have an energy or an environmental exhibit, you can tie it in with a scene from the *Dream Big* film. Example: “See the world’s largest solar array in the *Dream Big* movie, now playing in the theater, and learn more about sustainable energy in Exhibit Hall X.”

SCAVENGER HUNTS

School groups and camp groups are often looking for these, but kids of all ages love them. Consider thinking about your infrastructure as well as your exhibits as engineering resources for a *Dream Big*-themed scavenger hunt. The hunt could involve worksheets, photos, or both! Ideas include:

- Finding specific exhibit components that discuss engineering topics associated with the film (bridges, energy conservation, or earthquake-proof designs).
- Using broader descriptions of items to hunt for, such as “an energy-saving device,” which could include motion-sensor water fountains or lighting, windmills or solar panels on your museum or school grounds, or even bike parking to encourage sustainable commuting.
- Taking advantage of ubiquitous smartphones: the event could be a **photo scavenger hunt** where the pictures and visit could be reviewed back in the classroom.

SCIENCE CAFÉS BECOME ENGINEERING CAFÉS

Create these social events with speakers from your community to spotlight engineering careers, achievements, community projects, or hot topics in engineering.

STEM CONTESTS AND COMPETITIONS

If your institution offers STEM contests or competitions, these can also be tied in with *Dream Big*. Use the film as a kickoff to inspire participants or give away movie tickets as prizes. Even the film's title can be good for STEM competitions: invite students to *Dream Big* with their entries! The St. Louis Science Center has developed innovative ways for a museum to participate in the First Robotics Competition, a huge national program. Robotics fits in perfectly with *Dream Big* because a robotics competition is featured in the film. Orlando Science Center hosts Otronicon, an expo on interactive technology, simulators, and video games that provides a glimpse into the future of how technology affects the way we work, learn, and play. It's another good tie-in with *Dream Big*.

WAITING IN LINE

Use *Dream Big* hands-on activities to entertain guests or provide programming to people while they are waiting in line at the box office or theater lobby. Some of the activities only take 10 or 15 minutes to do—like *Cable-Stayed Bridge*, *Build a Spinning Top*, or *Zip Line*—and that makes waiting in line fun. It's also a guaranteed way to get an audience interested in learning more about engineering and STEM.

SPECIAL EVENTS THROUGHOUT THE YEAR

CREATE A DAY (ANY DAY!) OF ENGINEERING AT THE MUSEUM

Invite people who are coming to visit the exhibits to enhance their experience by seeing the film. And vice versa: encourage people who come to see the film to visit exhibits and other programs that enrich the film experience.

HOW DOES YOUR COMMUNITY *DREAM BIG*? FEATURE THE COMMUNITY'S BIG ENGINEERING PROJECTS

Coordinate a program that features a big engineering project in your community—such as a bridge, tunnel, skyscraper, or water project.

- Build a display.
- Bring in speakers.
- Hold a day-long program with displays and local engineers as speakers.
- Run a social media contest. For example, through Facebook or Instagram, ask museum “fans” to take pictures of their own engineering projects or of engineering in the community and then tag the museum or use a hashtag you create (like *#raleighdreamsbig*, *#dreambigphiladelphia*, etc.). A prize could be offered to the best picture, such as a four-pack of passes to the *Dream Big* film. The winning photos could be showcased on the museum's Facebook page or website.

MAKER FAIRE AND MINI MAKER FAIRES

Over 100 fairs celebrating technology and crafting in communities, universities, and schools are held worldwide, and more are added each year. The events are part science fair celebrating local makers and inventors, and part showcase of local companies and artists. The events are for families and visitors of all ages, and many cultural organizations and museums participate. Ideas:

- Because these events are often outdoors and attract several hundred to several thousand visitors, provide “quick hit” activities with easily sourced materials that can accommodate a variety of learners and large crowds.
- *Dream Big* engineering outreach activities—such as *Design a Shoe* or *Build a Better Bubble Blower*—are the perfect fit for the theme of the event. Add promotional materials about the film (e.g., pop-up banners or educator guides for teachers) to drive visitation to a museum and theater.

PUBLIC PROGRAMS FOR SEASONAL OR NATIONAL EVENTS

Link to calendar events such as Earth Day, Black History Month, Father’s or Mother’s Day, Chemistry Week, and so on. Selections from the 50+ hands-on activities for *Dream Big* can be used in a variety of ways. Just 4 to 6 activities could be presented in the exhibit halls by museum staff or by local engineers and college student groups for each event. Find more ideas in the **Year Round Program** section, which includes a programming matrix that shows which of the *Dream Big* 50 Activities work best with various calendar events.

PROGRAMS FOR UNIQUE AUDIENCES

CAMPS

Create an engineering camp-in or summer camp at your museum, including one for girls only. Campers can find inspiration in *Dream Big*, which shows kids working in clubs to participate in engineering events. *Foil Boats*, *Build a Personal Flotation Device*, *High Dive*, and *Build a Better Bubble Blower* are examples of summer-ready activities perfect for camp.

SCHOOL GROUPS

- Visit the **For Teachers** section of the website and explore 12 *Dream Big* lesson plans for K–12 in the Educator Guide. The lesson plans are tied to the NGSS.
- Investigate the possibility of creating a themed school visit program.
- A program could include a viewing of the *Dream Big* movie combined with a 20- to 45-minute educational program or learning lab tied to the topics in the film.
- A program could include a viewing of the *Dream Big* movie and then a visit to a renewable energy gallery, a wind tunnel exhibit, an erosion stream table, an earthquake shake table, or an extreme weather live presentation.
- Potential themed school visits can be connected to NGSS standards such as forces, interactions, and engineering design, which are major themes in the elementary, middle, and high school curricula.

- Schools can participate in a *Dream Big* engineering activity during the museum visit, or in a pre-visit activity in preparation for the field trip.
- Connect with the *Dream Big* network of engineers to find mentors to help engage with students in the classroom or at the museum. Contact Gwen Hearn, *Dream Big* volunteer coordinator, at gwen@DiscoverE.org.
- For **outreach to schools**: Create an engineering-related van.

SCOUT GROUPS

These groups also seek opportunities to engage in engineering and design. Both Boy Scouts and Girl Scouts incorporate engineering into programs for all ages, including an engineering merit badge for Boy Scouts and several different Girl Scout badges for invention and project design. The requirements are different for each scouting age group, but generally include:

- Researching a product or an invention
- Building and testing a design solution with simple materials
- Interviewing an engineer or a designer

Museums could host a scouts' *Dream Big* day by hosting a screening of the film and inviting local engineers to talk to scout groups. Engineers could host a question-and-answer session after the film with sample questions like:

- What kinds of work do you do in your career?
- Many of the engineers in the film were inspired by a personal event in their lives. What got you interested in engineering?
- The robotics team in the film became interested in engineering because of a passionate teacher. Who were your engineering role models?
- The civil engineer from Turkey in the film mentioned that she was a “girly girl” growing up. What sorts of hobbies and interests did you have as a kid?

Ask engineering organizations to host activity stations so that scouts can build and test engineering designs.

ENGINEERING CAREERS FOR STUDENTS OR SCOUTS

- Look for engineers who work in different industries to demonstrate the breadth of careers available to engineers.
- For students' first exposure to engineering design and careers, it is also best for engineering mentors to focus on their resilience and willingness to learn from each project rather than to focus on grades and academics. It's also important to mention how they didn't just focus on math and science for their ideas, but were inspired by other subjects as well.
- To help engineers understand how to communicate to kids, have them view the tutorial “Effectively Talking to Kids About Engineering” at this link: discovere.org/volunteers-educators/volunteer/effectively-talking-to-kids-about-engineering.
- Encourage engineers to bring models that can be handled and drawings that are appropriate for the age groups.
- Guest engineers could also facilitate some of the *Dream Big* activities with museum staff to work with students and make connections between the activities and the creative problem solving they use in their careers.

CAMP-INS OR FAMILY SLEEPOVERS

Plan a *Dream Big* theme for camp-ins, and there will be enough activities to keep kids and families busy all night.

- Campers can watch the film, have popcorn, and then participate in a number of hands-on engineering activities that relate to the film. Engineers from the community can bring their families and also volunteer to run the demos with the activities all night.
- Great activities include: *Build a Cable-Stayed Bridge* and *Slender Tower Challenge*. Bounce music from lasers in the *Laser Challenge*!

FOR MEMBERS AND ADULTS

Member events are a great opportunity to introduce families to new programs and exhibits.

- A *Dream Big* members' event could include a screening of the film, a question-and-answer session with guest engineers, and several activities from the *Dream Big* educational resources staffed by museum staff and volunteers.
- Consider programs especially for engineers and their friends and families. Host an Engineering Day with discount film admission for engineers. Organize an "over 21" evening for young engineers to see the film, have cocktails, and try some activities. Work with local engineering organizations and companies to promote the events.
- Guests could be encouraged to visit all of the different activities with an activity "passport" and collect stamps at each station. The passport could list either specific activities or broader themes such as transportation, energy, and structures. Download a *Dream Big* passport design from the website.
- Families with completed passports could redeem their passports for a special prize.

LECTURE OR PANEL SESSION

- Plan a panel of several industry professionals moderated by a museum staff person. Choose topical engineering issues such as sea level rise, flooding or natural disasters, drought, and aging infrastructure as the basis of discussion. Show a clip from *Dream Big* or one of the web videos to provide context for the discussion.
- Host public programs on STEM and environmental topics.
- Screen the *Dream Big* film with a question-and-answer session.
- For an adult-focused event, local engineers could be tasked with talking about the themes of the film—solving grand engineering challenges such as energy, food and water availability, and climate change—while also discussing the social and financial decisions involved. They could speak about local engineering projects as well.
- Community organizations and local college groups could be invited to attend and to submit questions or speaker suggestions in advance.

