

Engineering List of Video Resources

The video resources in this package are divided into two categories:

1. The first category, “**Program Videos,**” lists archived versions of our live, interactive student programs that explore multiple concepts and topics related to engineering.
2. The second category, “**Topic Videos,**” includes short videos that deal with a specific topic, issue, event, or person related to engineering. Some of the “topic videos” listed here are also featured in one of the archived live programs. If so, the name of the archived program video is included in parentheses.

More information on each video, including a description of its content, grade levels targeted, and any teacher tools or student tools related to it, can be found on its video play page by clicking on its title below. Time length for each video is provided below and on its video play page.

Program Videos:

Engineering 8: History in the First Person: Building the Mercury Capsule 2 (59:32)

Engineering 9: The Science Behind the New Mississippi River Bridge, Part 1 (55:27)

Engineering 10: The Science Behind the New Mississippi River Bridge, Part 2 (54:18)

Infrastructure 3: The Science Behind Sewer Systems (59:37)

Physics 9: The Science Behind Roller Coasters (43:02)

Robots 7: The Science Behind Robots (60:00)

Space 9: History in the First Person: The Gemini Project (59:47)

Space 11: History in the First Person: Building the Mercury Capsule (57:24)

Topic Videos:

Aviation 14: Designing a Fighter Jet (7:47)

Engineering 1: What factors determine what kind of bridge goes in a particular location? (1:39—also seen in Engineering 10: The Science Behind the New Mississippi River Bridge, Part 2)

Engineering 2: How are seismic considerations taken into account when designing a bridge? (00:28—also seen in Engineering 10: The Science Behind the New Mississippi River Bridge, Part 2)

Engineering 3: How were cranes utilized and operated during construction of the cable-stayed bridge? (00:48—also seen in Engineering 10: The Science Behind the New Mississippi River Bridge, Part 2)

Engineering 4: What happens if a cable breaks on a cable-stayed bridge? Can it be fixed? (00:58—also seen in Engineering 10: The Science Behind the New Mississippi River Bridge, Part 2)

Engineering 5: What “green practices” are taken into account when constructing a bridge? (00:43—also seen in Engineering 10: The Science Behind the New Mississippi River Bridge, Part 2)

Engineering 7: What skills are important to being a successful engineer? (00:38—also seen in Engineering 9: The Science Behind the New Mississippi River Bridge, Part 1)

Engineering 11: You Are Here: Arch (23:32)

Engineering 13: You Are Here: Eads Bridge (19:02)

Engineering 15: Design Considerations (01:45—also seen in Engineering 9: The Science Behind the New Mississippi River Bridge, Part 1)

Engineering 16: Why a Cable Stayed Bridge (00:58—also seen in Engineering 9: The Science Behind the New Mississippi River Bridge, Part 1)

Engineering 17: Factoring for Traffic (00:37—also seen in Engineering 9: The Science Behind the New Mississippi River Bridge, Part 1)

Engineering 20: How does the design process for a roller coaster begin? (01:07)

Engineering 22: How long does the design/planning part of a roller coaster take on average and what does the process look like? (02:07—also seen in Physics 9: The Science Behind Roller Coasters)

Engineering 23: Example of Student Roller Coaster (00:49)

Engineering 24: How do you determine the initial height of a roller coaster to ensure that there is enough energy for the coaster to make it from beginning to end? (00:59—also seen in Physics 9: The Science Behind Roller Coasters)

Engineering 25: If a coaster needs more energy in the middle of the track, how do designers accomplish this? (00:32—also seen in Physics 9: The Science Behind Roller Coasters)

Engineering 26: Does the material the coaster is made of affect what you can do with the design? (01:01)

Engineering 27: Some roller coasters do not use potential energy as initial energy. How do the roller coasters, like the ones that shoot out at high speeds, work? (02:03—also seen in Physics 9: The Science Behind Roller Coasters)

Engineering 28: How do brakes on a roller coaster work to dissipate energy? (01:47)

Engineering 29: Example of Student Roller Coaster (01:34)

Engineering 30: What are some different ways that engineers dissipate energy to slow the coaster down as it enters the station? (01:20—also seen in Physics 9: The Science Behind Roller Coasters)

Engineering 32: What personal characteristics do you feel are necessary to be a successful engineer? (00:55)

Engineering 35: Have you ever designed a water roller coaster and what specific challenges do these create in terms of energy usage? (01:26—also seen in Physics 9: The Science Behind Roller Coasters)

Engineering 36: Do coasters where you’re hanging rather than riding in a car have to be designed differently? (00:51)

Engineering 37: What are some general safety precautions or rules designers have to follow to ensure their roller coasters are safe? (01:17—also seen in Physics 9: The Science Behind Roller Coasters)

Engineering 38: Is there a difference when designing a wooden roller coaster versus a steel one? Which do you prefer to design? (01:26—also seen in Physics 9: The Science Behind Roller Coasters)

Space 3: How did technology used for Gemini missions affect the advancement of technology that was used by the average American? (00:59—also seen in Space 9: History in the First Person: The Gemini Project)

Space 4: How were the materials necessary for construction of the spacecraft determined? (01:03—also seen in Space 9: History in the First Person: The Gemini Project)

Space 6: Were any unusual materials chosen to help build the Gemini capsule and adapter? (01:21—also seen in Space 9: History in the First Person: The Gemini Project)

Space 7: What were the challenges in design of the capsule to allow for space walks? (01:14—also seen in Space 9: History in the First Person: The Gemini Project)

Transportation 14: How an Electric Car Operates (01:16)

Transportation 21: How Locks and Dams Work on the Mississippi River (02:07)

Transportation 22: Using Locks and Dams to Maintain Navigational Channels (00:42)

Transportation 23: How Barges Go Through Locks and Dams (01:09)