Simply Beautiful—Activities Info for Week One

Day 1

Introduction to Engineering and Design Powerpoint (https://docs.google.com/viewer?a=v&pid=sites&srcid=c3RhZmYuY3JhdmVuLmsxMi5uYy51c3x0ZWR8Z3g6M2FmMDE1MjdjMmEwYTMzYw) and using the Decision matrix to test options (20 min)

Activity: Card tower (25 min)

Materials

100 pack of index cards per team of 4

One copy of Decision Matrix per team

Meter stick

Class challenge is to use the pack of index cards to build the tallest card tower possible.

Teacher Notes

The only intended constraints are time (25 min) and the number of cards(100). Do not prevent students from folding or tearing cards but do not tell students to fold or tear either. Let them struggle until they succeed. Encourage student to use their decision matrix to document the pros and cons of what they have tried. Take measurements as students announce they have finished and write them on the board with the ranking of heights. Update the numbers as the student continue to try and out do the other teams.

Day 2

To reinforce the Engineering and Design process and to continue team building students will be completing the Marshmallow Challenge

Activity: Marshmallow Challenge (25 min)

Materials

Meter Stick

Count down timer projected on the board set to 18 minutes

Each team of four will need the following

Decision Matrix

20 Sticks of Spaghetti

1 meter of 1/2” masking tape

1 meter of string

1 large marshmallow

Teams are given 18 minutes to build the tallest free standing spaghetti tower they can that will support the marshmallow at the top.

Teacher notes: Encourage the use of the decision matrix to create a quick plan. They should sketch some ideas for the tower framing. The original website and TED talk can be found at: http://www.marshmallowchallenge.com/Welcome.html

Debrief this activity by discussing the results of the structures and the team dynamics.

Day 3

Continuing to create team unity and understanding the Engineering and Design process at work students will be combining the previous two activities. Today's marshmallow is a 2 to 3 pound textbook. Students will reengineer their card tower experience to be tall and hold a load. The goal is to construct the tallest card tower that is capable of supporting a small textbook.

Activity: Tall and Strong Card Tower (40 min)

Materials

Meter stick

Each team will need the following

Decision Matrix

100 Index Cards

Small text book *(Each team should have the same book)*

Teacher Notes: Students will want to reassemble the tower they did on day 1 right away. Encourage them to rethink their towers for the new constraint and to test the load bearing capacity frequently rather than waiting to the end. As with the other activities write the current place holders on the board to encourage working toward the tallest structure.

Day 4

Introduce students to the wikispace (http://steam-sculpture.wikispaces.com/). Today they will begin to study the Vollis Simpson Wind machine as well as the life of Vollis Simpson to gain an understanding of kinetic sculpture. Student will explore the contents of the wikispace to include the challenge, CAD/CAM videos, Simple Machine videos, and other related content. Teams will decide on the roles each member will fulfill as Project Manager, Accountant, CAD Programmer, and Promoter. All students are ultimately responsible for the construction and delivery of a working prototype.

Use VTS to study Vollis Simpson

Day 5

Teams will begin to develop a logo for their team and research successful branding. Students should brainstorm different designs to try and capture the identity of the group. Teams will want to consider how their team identity will be reflected in the final structure

Day 6

Students will explore simple machines and try to identify simple machines present in the Vollis Simpson Wind Machine and how they are used. Students will complete simple machines investigation by calculating the IMA and conducting experiments to find the AMA at stations around the room.

Activity: Simple Machines Investigation

Levers Station

Gears Station

Pully Station

Incline plane station

Wheel and axle station