ACTIVITY SHEET

ENTERPRISE + STEM

THE MARSHMALLOW CHALLENGE

Objectives

- Developing team building and collaboration skills
- Developing resilience in the face of challenges or frustrations
- Developing design and testing skills

Activity

Task

You are required to assemble the tallest freestanding structure in 18 minutes.

The activity should be completed in groups of four students.

Materials

- 20 x sticks of uncooked spaghetti
- 1 x marshmallow
- 1 x meter of string
- 1 x meter of tape

Rules of the game

- Aim is to build the tallest structure
- The entire marshmallow must be on top
- Use as much or as little of the kit as needed
- Break up the spaghetti, cut the string or tape as needed
- The challenge lasts 18 minutes
- The team must step away from the structure when the time is up, otherwise the team will be disqualified

INSTRUCTIONS FOR TEACHERS

Instructions for teachers

- Start the countdown clock with the start of the challenge (e.g. online stopwatch https://www.online-stopwatch.com/). Possibly start the music.
- Walk around the room, observe teamwork and the patterns of innovation most teams follow.
- Remind team of the time, e.g. at 10 minutes, 5 minutes, 2 minutes, 1 minute, and 30 seconds countdown.
- Remind the teams that all team members must step away from the structure or risk being disqualified.
- When the time is up ask everyone to sit down or stand where they can see all structures.
- Measure the standing structures and announce the heights. Note some structures will notstand after the teams move away.
- Determine the winning team. Ensure the team gets an ovation (and a prize if this was offered at the beginning of the challenge)

Suggested discussion

- What was the hardest part of this challenge? What was the easiest part?
- What building techniques make the tower stronger?
- Does the placing of the marshmallows affect the strength of the tower?
- Does the size of the base alter the strength of the tower?
- What would you do differently if you had the chance to rebuild the tower? What lesson(s) have you learnt?
- Compare your model to other teams' models. Why some models are stronger and more stable than others?
- Did group members assume different roles? How do you think you worked as a group?
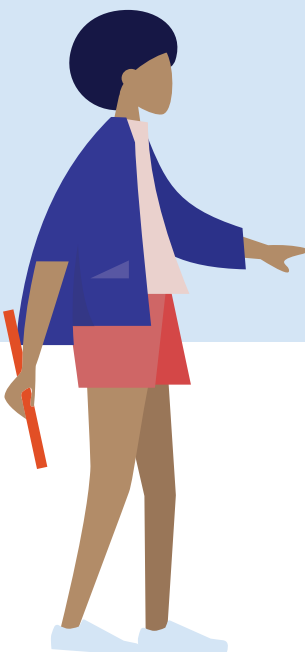
This activity is based on the Peter Killman Spaghetti Tower Design Challenge http://www.peterskillmandesign.com/spaghetti-tower-design-challenge

CURRICULUM MAPPING

General Capabilities: Personal and Social

Years 7-8	Years 9-10
Social Awareness and Management	
Collaboration	
	Develop specific skills and a variety of strategies to prevent or resolve conflict, and explore the nature of conflict resolution in a range of contexts (VCPSCSO051)

General Capabilities: Critical and Creative Thinking

Years 7-8	Years 9-10
Metacognition	
Consider how problems can be segmented into discrete stages, new knowledge synthesised during problem-solving and criteria used to assess emerging ideas and proposals (VCCCTM042)	Investigate the kind of criteria that can be used to rationally evaluate the quality of ideas and proposals, including the qualities of viability and workability (VCCCTM053)
Questions and Possibilities	
Suspend judgements temporarily and consider how preconceptions may limit ideas and alternatives (VCCCTQ033)	Suspend judgements to allow new possibilities to emerge and investigate how this can broaden ideas and solutions (VCCCTQ044)

Science

Years 7-8	Years 9-10
Science Inquiry Skills (strand)	
Communicating (sub-strand)	
Communicate ideas, findings and solutions to problems including identifying impacts and limitations of conclusions and using appropriate scientific language and representations (VCSIS113)	Communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations (VCSIS140)

Design & Technologies

Years 7-8	Years 9-10
Creating Designed Solutions	
Investigating	
Critique needs or opportunities for designing and investigate, analyse and select from a range of materials, components, tools, equipment and processes to develop design ideas (VCDSCD049)	Critique needs or opportunities to develop design briefs and investigate and select an increasingly sophisticated range of materials, systems, components, tools and equipment to develop design ideas (VCDSCD060)
Generating	
Generate, develop and test design ideas, plans and processes using appropriate technical terms and technologies including graphical representation techniques (VCDSCD050)	Apply design thinking, creativity, innovation and enterprise skills to develop, modify and communicate design ideas of increasing sophistication (VCDSCD061)
Producing	
Effectively and safely use a broad range of materials, components, tools, equipment and techniques to produce designed solutions (VCDSCD051)	Work flexibly to safely test, select, justify and use appropriate technologies and processes to make designed solutions (VCDSCD062)