

## Team Builders/Engineering Challenges

The Team Builders/Engineering Challenges listed are great for the first couple of meetings to build momentum and interest in MESA. Each one has materials listed and average time to complete the challenge.

### Contents

<b>Suggested MESA meeting pacing</b> .....	1
<b>Straw Towers</b> .....	2
<b>Straw Bridge</b> .....	2
<b>Straw Boat</b> .....	2
<b>Cup Tower</b> .....	3
<b>Tennis Ball Straw Tower</b> .....	3
<b>Classic Egg Drop</b> .....	3
<b>Pasta Bridges</b> .....	4
<b>Straw Gliders</b> .....	4

### Suggested MESA meeting pacing

Introduce challenges. (3 minutes)

Each team member sketches own idea on paper. (5 minutes)

Each member presents idea to team. (5 minutes)

Team creates a collaborative sketch that must include an idea from each member on the team. Teams then share sketch and explain how each person idea is represented in the sketch and given supplies for challenge. (5 minutes)

Build time. (20 minutes)

Whole group testing (10 minutes)

Clean-up ( 5 minutes)

### Straw Towers

Challenge: Build the tallest free-standing tower.

Materials: 20 straws per team (2-4 people)

1 meter masking tape per team

Tape measure

Note: The tower may not be taped to the desk or floor.

### Straw Bridge

Challenge: Build a straw bridge to hold as many books as possible

Materials: 20 Straws per team (2-4 people)

1 meter of masking tape per team

Note: To make this challenge more difficult, make the distance the bridge must span greater than the length of the straws.

### Straw Boat

Challenge: Build a straw boat to hold as many pennies (or other weight) as possible without sinking.

Materials: 20 straws per team (2-4 people)

1 meter masking tape per team

At least 100 pennies

Some kind of tub half-way filled with water

### Cup Tower

Challenge: Build the tallest free standing cup tower

Materials: 20 small plastic cups per team (2-4 people)

1 meter masking tape per team

Tape measure

### Tennis Ball Straw Tower

Challenge: Build the tallest free standing straw tower to hold a tennis ball at the top of the tower for at least 30 seconds.

Materials: 20 straws per team (2-4 people)

1 meter masking tape per team

Tape measure

Tennis Balls

Timer

Note: You can add more straws or more tape to adjust the challenge.

### Classic Egg Drop

Challenge: Design a device to safely drop a raw egg from specified height.

Materials: Newspaper

Tape

Raw Eggs (1 per team)

Somewhere to drop the devices

Note: The devices can also be made from recyclable materials. Students may not put tape around the egg.

## Pasta Bridges

Challenge: Build a bridge out of raw spaghetti and mini marshmallows to hold as many books as possible

Materials: ½ package of spaghetti per team (2-4 people)

Approximately 30 mini marshmallows

Note: Try to limit the number of marshmallows or allow for students to ask for more, if needed. Otherwise many of them “mysteriously” disappear.

## Straw Gliders

Challenge: Build a straw glider to fly the farthest using a single straw, half sheet of paper, and tape

Materials: 1 straw per team (2-4 people)

½ meter of scotch tape

½ piece of copy or notebook paper

Note: Using different size circles taped to the straw works best. It might be helpful to demonstrate a straw glider with two paper circles attached to the group and have students innovate from that prototype.