Dose of Discovery: Week 3
Lego Engineering Challenge

**Learning Points:**
- Children will be able to have fun and innovate with the Lego bricks.
- Children will need to think critically about their challenge and come up with a solution to the problem that is given to them.
- Children will learn to communicate their building approach with the rest of the family.
- Children will meet several real world engineering challenges, such as limited resources, time deadlines, and creative differences.

**Materials:**
- Collection of Miscellaneous Lego pieces
- Lego Challenge Cards – Printed and cut into individual cards

**Activity:**

**Step 1:**
Depending on the number of siblings, you can have each child do a challenge or have the children get into pairs to tackle the challenges together, or both!

**Step 2:**
Explain to the kids that they get to tackle some building challenges with Legos.

*Ask the kids to share a favorite Lego building project that they have done in the past.*

Depending on the age, you can have the child write a short paragraph as to why this project was their favorite or draw a picture of the finished project.

**Step 3:**
Have each kid or group of two siblings pick a Lego Challenge card blindly from the stack and have them tackle each challenge with the available bricks that they have in their own collection at home.

Monitor the building projects to be able to show the kids the Engineering correlations with the challenges. Be ready to help out with any frustrations and work through the challenges with the kids as well.

Adapted from activity on https://thestemlaboratory.com/lego-challenge-cards/
Extended Learning Tips:

Look for the following Engineering connections built into the challenges for “in the moment” learning opportunities:

- **Collaboration:** Having the siblings work in pairs can help them to learn effective communication and conflict resolution. Monitor this time for any teaching moments and/or to help them work out their differences if they come to an impasse.

- **Limited Resources:** Only having a few/handful of Legos or all blue Legos is a limited resource challenge – Engineers across the world often have to get creative with either a budget or with what specific building materials they have available to them.

- **Structural Engineering:** Any structure (tree, house, bridge, etc.) needs to have a strong foundation in order for the build to be successful – have the children think about what shapes are stronger to use in the foundation as well as other strategies to create a strong, structural foundation.

- **Active Geometry:** Spatial reasoning skills are required on many of the challenges – How to make a round shape with square materials; making something symmetrical; or building an upside down house.

- **Deadlines:** Try to do some challenges that are timed. Give the children 5-10 minutes (depending on age) to get their building challenge done. Engineers and Architects are constantly given deadlines and have to come up with creative solutions under the clock.

- **Setbacks:** If your kid ever gets frustrated during a challenge or if their project breaks and they have to start over, try to encourage them that overcoming adversity and even mistakes is a part of every Engineers’ life and experience. Sometimes a strategy does not work and learning from those mistakes and starting again is all part of the creative and building process.

Adapted from activity on https://thestemlaboratory.com/lego-challenge-cards/
Build your favorite fruit and see if a friend can guess it.

Make a LEGO bridge.

Make a pattern with LEGOS.

Build an animal with LEGOS.

Make a LEGO tree that stands on its own.

Build something with just 4 LEGOS.

Create a dinosaur.

Fill the rectangle below without going over its edges.
Make something that starts with the letter B.

Build a triangle that is the same length on two sides.

Build a rainbow.

Make a LEGO beach ball.

Build a flower.

Make an upside down house.

Grab a handful of LEGOS and build something using every single piece.

Make a parachute LEGO man that really flies.
Build something that flies.

Make something that is symmetrical – the same on both sides.

Make a LEGO car that really drives.

Build a fire station.

Build a LEGO pyramid.

Make a boat that really floats in water.

Build something made entirely of blue LEGOS.

Build your name with LEGOS.
Build a LEGO tic-tac-toe board and then play a game with it.

Make a marble maze and challenge a friend to solve it.

Build something while you are blindfolded.

Make a LEGO igloo.

Build something in just one minute.

Make a musical instrument with LEGOS.

Build the tallest LEGO tower you can without it falling over.

Make a miniature model of your house.