Grade Level: Kindergarten	**Topic:** Building Shapes and Structures
Lesson: It's a Marshmallow World	**Timing:** 1 hour
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EDUCATOR INTENTION(S)
This fun, inquiry-based lesson focuses on fine-motor and STEAM skills. This lesson works well in congruence with learning about shapes and counting. Learners may work through this activity individually, or in partners to foster collaboration skills.

EXPECTATION(S)
Strand: Problem Solving & Innovating (Ontario, 2016)

Expectations:
13.2 Make predictions and observations before and during investigations.

24.1 Identify practices that ensure their personal safety and the safety of others, and demonstrate an understanding of the importance of these practices.

24.5 Communicate and record results and findings either individually or in groups (e.g., explain how they made their structures, record their ideas using words, pictures, labels, charts, or numbers.

SAFETY CONSIDERATIONS
- Need to discuss safety expectations with students regarding the materials being used and *why* we need to use them safely.
    - Materials are only being used for the designated activity, not being thrown, etc.
    - Marshmallows are not to be eaten.
    - Depending on the materials being used, some have pointy ends that we need to be careful of so that we don't poke ourselves or others.
- Confirm that there are no allergies to any of the marshmallow/pasta ingredients.
- Confirm that marshmallows (with gelatin) do not conflict with the religious practices of any students.
- Diligent observation is required by educators to ensure safe use of materials.
- Students should wash their hands after completing the activity.

RESOURCES AND MATERIALS
- Marshmallows – at least one large bag.
    - Marshmallow size should be chosen at educator's discretion – large marshmallows will be more accessible to some students, but small marshmallows will prompt even further development of fine-motor skills.
- Choice of connecting material
    - Popsicle sticks – easiest to handle, works well for large marshmallows.
    - Toothpicks – easy to push into hardened marshmallows, good for fine-motor development, safety consideration over pointy ends.
    - Dried pasta (spaghetti or fettucine) – good for fine-motor development, can be broken into different lengths, safety consideration over possible allergens.

PREPARATION

Space the marshmallows out on a baking sheet and allow them to dry out overnight. This causes the marshmallows to harden slightly which makes them sturdier for creating structures. It will also minimize the stickiness of the marshmallows making clean up easier.

Set up the learning environment to ensure that there is enough table space for each learner. Ensure that any required cleaning materials (paper towel, soap) are prepared for student/educator use.

LEARNING PLAN

Minds On: Begin with a read aloud of *Iggy Peck Architect* by Andrea Beaty. This is an exciting story about a child who builds all kinds of wonderful things out of anything they can get their hands on. It should foster some creative ideas about what learners could build during the activity. Have students think about the cover and title of the book and make predictions about what they think this story will be about.

Possible questions to ask during the reading:

- What is an *architect*?
- Pancake pie page: Think, pair, share: Have you ever built or created something out of food? Perhaps a mashed potato volcano?
- After the bridge collapses: What's the problem? How do you think Iggy might solve this problem?
- After the new bridge is created: What did Iggy and his classmates use to build the new bridge? Are those materials that we would normally use to build bridges? Think, pair, share: What materials do you think you could make a bridge out of?

Possible questions to ask after the reading:

- What have you built before? Did you have help or build them on your own? (Iggy worked with his classmates to solve the bridge problem)
- What materials have you used to build things from?
- What do *architects* need to do before they start building? (Make a plan)

Action: *Explain the marshmallow building center and review safety expectations.*

Suggested set up: At a large table, set out the materials in open containers. Set out enough materials for six learners to use the station at once. This amount should allow the educator to observe and converse with each student sufficiently while also allowing enough space for partner/small group exploration if appropriate.

Explain to learners that they will have the chance to create and build whatever their imaginations can think of, using some interesting materials. Hold up a marshmallow and toothpick individually, having learners identify the objects, what they are normally used for, and what safety expectations we should have when using these items. Ask them what safety expectations they can think of for this activity/ Ensure that the following points are included.

- We need to wash our hands well when we are finished working at this station to keep our hands and classroom clean.
- These materials need to stay at the center and are only being used for the activity at hand.
- Toothpicks have two pointy ends that we need to be careful with.
- Marshmallows (or any other material) are not for eating and we cannot put them in our mouths.

Take learners over the to the building center and explain that this station will be available for them to explore creating things/being an architect. Reivew the safety expectations again at this time, have students explain the safety instructions back to you.

Review that a very important part of an architect's job is planning. Explain that they will have to draw out their plan for what they are wanting to build (learners might share their plan in a way other than drawing based on their abilities and needs). They can use whatever classroom materials you have available for this, whiteboards, crayons on paper, etc. Monitor students as they work on their plan and have them explain to you what they are planning on creating before they begin building. Educators should inquire with questions at this stage such as,

- How many marshmallows do you think you will need to create your object?

- Where did you get this idea? Why did you choose to create this object?
- How are you going to make sure your object is sturdy/does not fall over?
- What do you think is going to be the hardest part of creating your object?

Let learners get to work on experimenting with the materials and eventually trying to create their designs. Monitor for safe use of materials. Observe if learners are able to follow their plan and/or make appropriate adjustments as needed. As learners are creating, prompt with questions such as,

- Why do you think your object keeps falling over?
- What could you do to fix that problem?
- How close is your creation to what you planned?
- Did you have to make any adjustments while you were creating your object?

Other ways that educators might run this activity:

1. Have students focus on 2D shapes. They can create them on their own, while the educator observes and prompts with questions. Or the educator might print out shape 'maps', that learners can use as an outline/guide in building their shapes. The educator might otherwise prompt the learners with challenges such as "Can you make a shape with *three* sides?" or "Can you make a shape using *four* marshmallows?"
2. Offer learners a specific challenge such as, building a bridge (perhaps one that can support the weight of a small object), create a character, build a tower, or invent a new toy and try to make it.
3. Focus on the bridge idea in *Iggy Peck Architect*, the whole class had to work together to build the bridge. Have learners create small sections either individually, or in partners/small groups, Attach them together to make one long, class bridge! The bridge may likely need supports at places, a stack of books or other objects would work well. This could be used as a class culture building activity.

While monitoring the station, the educator should have learners explain their work/thinking, whether or not things have gone according to their plan, how they adapted their plan/made changes, what they think of their final creation, what they might do differently next time, what else they would like to try creating in the future etc. Have learners explain these things to you verbally, or in another manner that suits the learner. If appropriate, have learners take turns presenting their creation to the class. This can be quite simple, having learners explain what they planned to make, how it went, and showing their creation.

REFERENCES

Beaty, A. (2007). *Iggy Peck, architect.* Abrams Books for Young Readers.

Ontario. (2016). The Kindergarten Program. [Curriculum].
https://files.ontario.ca/books/edu_the_kindergarten_program_english_aoda_web_oct7.pdf