Pumpkin Stand STEM Design Challenge

A lesson from the New Jersey Agricultural Society's
Learning Through Gardening program

OVERVIEW: Students will work in small groups to design a stand to hold a pumpkin, and then will try their stands to see if they work.

OBJECTIVES: The student will be able to:

- Design a stand for a pumpkin based on criteria provided.
- Compare multiple stand designs and with a group design a stand based on criteria provided.
- Build the stand with a group based on the design selected.
- Evaluate the group's stand based on the criteria provided.

GRADES: K-5

PROCEDURE:

Divide the students into groups of four. For K-2 students, write the criteria on the board or on a large paper. For 3-5 students, distribute the design challenge rubric sheets. Explain and review the criteria with the class and answer questions. Explain and review the challenge rules. Explain and review the time schedule. Tell students that you will be observing their progress and reminding them to stick to the challenge criteria, rules, and time requirements.

MATERIALS:

Paper	Straws	K-2: *Pumpkin Stand Design Challenge, How Did We Do?* sheet for each student
Tape	Glue	3-5 *Pumpkin Stand Design Challenge Rubric sheet for each student*
Craft sticks	One small pumpkin or one for each group	

Display the pumpkin at the front of the room. If available, every group can have its own pumpkin. Students may look at the pumpkin, but may not touch it or hold it to test the weight.

CRITERIA:

- Your pumpkin stand must be at least 6 inches tall
- Your pumpkin stand must stand freely
- Your pumpkin stand must hold the weight of one pumpkin

CHALLENGE RULES:

- Listen carefully to ideas from everyone on your team. Decide on the best design before you begin to build.
- You may only use the materials provided. You do not have to use all the materials provided.
- You must build your pumpkin stand in the time provided.
- You may use additional tools such as scissors and rulers.

TIME SCHEDULE:

Teacher will set a timer and notify students when to move on to the next step.

- 5 minutes for each student to sketch his/her own design.
- 5 minutes to brainstorm ideas as a group.
- 10 minutes to plan out the design.
- 20 minutes to create the product (the pumpkin stand).
- 10 minutes to reflect. How can we improve the design? What worked well? What did not work well?

New Jersey Learning Standards:

Science: K-2: ETS1.A,B,C 3-5: ETS1.A,B,C

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PUMPKIN STAND DESIGN CHALLENGE RUBRIC 3-5

Imagine that you want to display a pumpkin for everyone to look at. Today your challenge is to design and build a stand that can hold a pumpkin. You will have only 40 minutes to do this project. When all groups have completed their pumpkin stands, we will tests the stands to see if they work.

CRITERIA:

- Your pumpkin stand must be at least 6 inches tall.
- Your pumpkin stand must stand freely.
- Your pumpkin stand must hold the weight of one pumpkin.

CHALLENGE RULES:

- Listen carefully to ideas from everyone on your team. Decide on the best design before you begin to build.
- You may only use the materials provided.
- You must build your pumpkin stand in the time provided.
- You may use additional tools such as scissors and rulers.

To evaluate your pumpkin stand, circle how you met each specification below.

CRITERIA 	**3**	**2**	**1**
Height of stand is 6 inches or more	Yes!	Almost	Not really
Stands freely	Yes!	They barely touch	Not really
Holds the weight of the pumpkin	Yes!	A little unsteady	Not really
Original and creative	Impressive design	Unique design	Interesting design
Used materials on list only	Yes!	Some	Used a material not on the list

NAME_____

PUMPKIN STAND DESIGN CHALLENGE K-2
How Did We Do?

Our pumpkin stand is at least 6 inches tall.	YES	NO
Our pumpkin stand stands freely.	YES	NO
Our pumpkin stand holds the weight of one pumpkin.	YES	NO
We only used the materials on the table.	YES	NO
We worked together and listened to each other.	YES	NO
We are proud of our pumpkin stand design.	YES	We can do better next time.