

Finley Elementary Design Challenges- Washington STEM Grant

SE LASER - STC Kit the STEM Design Challenge developed for : 2nd Grade Changes
STEM Design Challenge Project Title: "Dump Truck Troubles"
Created by: Bill Pearson, Cami Cleaver, Anita Fabre
STEM Design Challenge Project Placement and Pacing Placement: End of unit. Pacing: 2-3 days
Overview: Students will explore different size screens/sifters and discover how they can separate materials of different size. Objectives: <ul style="list-style-type: none">• Students will further investigate different methods of sorting solid materials.• Students will cooperatively draft sentences to help create a classroom letter.• Students will collect data and share their observations through oral communication and writing.
STEM Design Challenge Problem: <p>Students will read the letter "Dump Truck Troubles." Freddy's family just bought a new house. His Dad says they need to fix up the backyard. Freddy wants a new swing set. His sister, Julie wants a sandbox. Dad wants to re-gravel the driveway. Dad places an order to the landscape company. He orders pea rock to put under the swing set, sand for the sandbox and gravel for the driveway. When the landscape company delivered the materials, a mistake was made and all the landscape materials are mixed together. The question is how can we help Freddy's family sort out the landscaping material for each of the areas? Students will use different size screens/sifters in an effort to sort the pea gravel, the sand, and the gravel. After trying several screens on all three landscaping materials the student will record his/her observations on the data chart.</p>
Materials List: (per group for sorting exercise - <i>suggested group size of 4-5 students</i>) <ul style="list-style-type: none">• 1 large tub of rock mixture• 4-5 sizes of screens/ sifters• 2 spoons• 2 - 9oz clear cups• 1 plastic gray tub• 3 containers for sorting• 1 data table

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Materials List: (for classroom letter)

- Blank letter form (1 for classroom)
- Cooperative sentence strips (2 per group)
- Pocket chart (1 per classroom)
- Student copy of letter form (1 per student)

Instructional Plan: (For Sorting Activity)

1. Set up materials needed in gray tub (one per group of 4-5 students)
 - 1 large tub of rock mixture
 - 4-5 sizes of screens/ sifters
 - 2 spoons
 - 2-3 9oz clear cups
 - 1 plastic gray tub
 - 3 containers for sorting
2. Read orally with the class the “Dump Truck Troubles” letter from document camera.
3. Discuss the letter and have students determine the problem to be solved.
4. Have students retrieve plastic gray tubs and data table from science table.
5. Introduce the materials in plastic gray tubs and explain that these are the tools they will use to solve Freddy’s family’s problem.
6. Post student procedure and explain what is expected.

1. Gather materials from the science table.
2. Set up your sorting station.
3. Choose a screen and try sorting the landscape materials.
4. Record your results on the Data Table.
5. Repeat steps 3-4 for each screen.

7. Have students begin investigation.

Instructional Plan: (For Classroom Letter)

Conclusion: Class Data Results Letter

(GLAD Cooperative strip paragraph)

Steps 1-5 performed in groups

1. Each group will generate 1-2 sentences to be included in a response letter to Freddy’s Family.
2. Two groups will be asked to explain how they sorted the **sand** from the landscape mixture.
3. Two groups will be asked to explain how they sorted the **pea rock** from the landscape mixture.
4. Two groups will be asked to explain how they sorted the **gravel** from the landscape mixture.

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Instructional Plan: (For Classroom Letter) (continued)

5. Students will write their sentences on to sentence strips.

Steps 6-9 performed as a whole class

6. Put sentence strips into pocket chart.
7. Rearrange sentence order, make better word choice. (tear or replace words)
8. Add letter features (date, greeting, closing)
9. Students will agree on letter and copy final copy to place in science notebook.
(Student copy of Letter Form)

Resources:




- Changes (Teacher's Manual Science LASER Kit)
- Available library books on Sifting and Sorting Solid materials

Evidence:

- Student Data Table
- Correctly sifted materials
- Creation of Class Letter

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Data Table: Record observations and describe which screen worked best. Why do you think it worked?

<p>Gravel</p> 	<p>Screen and Observations</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<p>Explanation</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p>Sand</p> 	<p>Screen and Observations</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<p>Explanation</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
<p>Pea Rock</p> 	<p>Screen and Observations</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<p>Explanation</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

Dump Truck Troubles

Freddy's family just bought a new house. His Dad says they need to fix up the backyard. Freddy wants a new swing set. His sister, Julie wants a sandbox. Dad wants to re-gravel the driveway. Dad places an order to the landscape company. He orders pea rock to put under the swing set, sand for the sandbox and gravel for the driveway.



Oh no, when the landscape company delivered the materials, a mistake was made and all the landscape materials are mixed together!

How can we help Freddy's family sort the landscape materials for each of the areas? Please send a written suggestion on how you can help Freddy's family.

Send to: Freddy Stone

45 Bedrock Road

Boulder, Washington 99339

