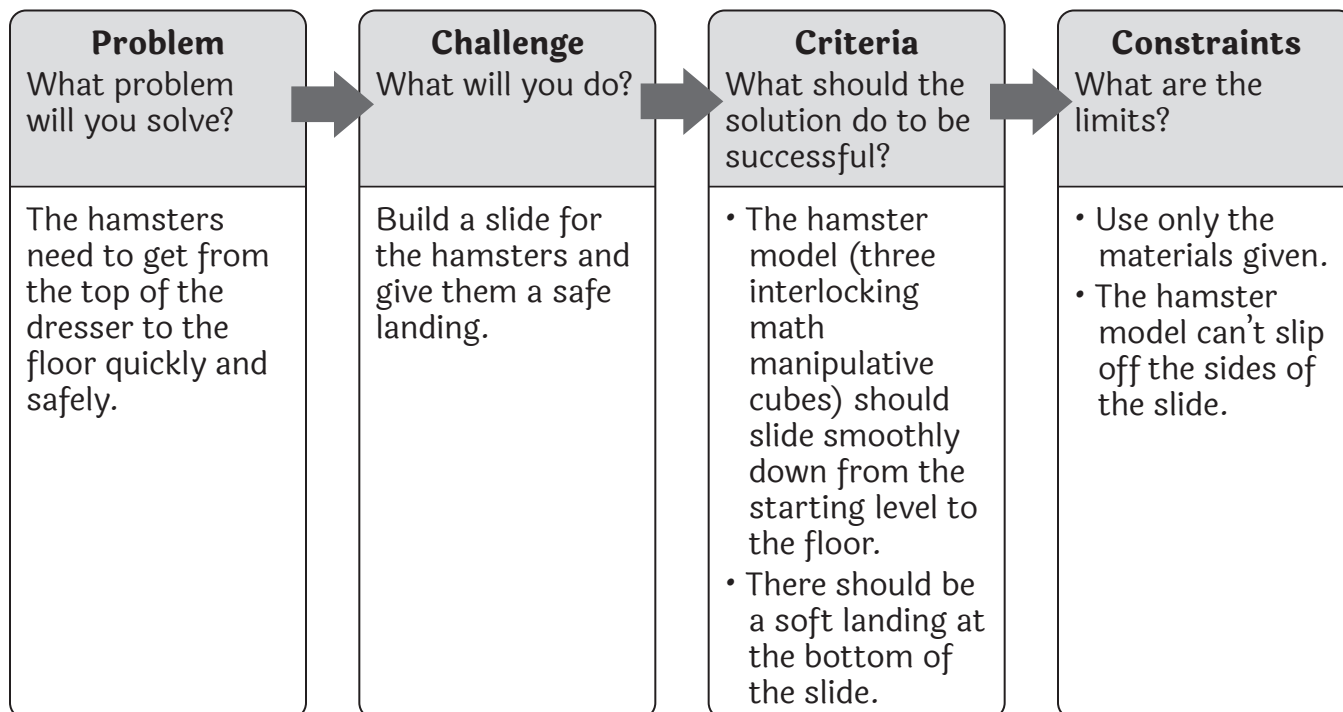


PLOT SUMMARY:

Hamsters Miss Cookie Cheeks and Sir Fluffsalot go on a quest for a carrot treasure.

HAMSTER SLIDE CHALLENGE:



OTHER POSSIBLE PROBLEMS AND CHALLENGES:

Students can use the *Universal Challenge Pages* (pages 104–107) to create solutions to any of the problems below or problems they identify themselves.

Problem	It is hard for the hamsters to walk across the pile of laundry.
Possible Challenges	- Build special shoes for the hamsters that work like snowshoes, distributing their weight to make walking easier. - Build stilts for the hamsters. - Create a tunneling machine so they can go under the pile.

Problem	The hamsters need help getting the carrot back to their cage.
Possible Challenges	- Build a carrier with wheels to help them move the carrot. - Engineer a device using pulleys to help them get the carrot up to the top of the dresser. - Build a catapult to launch the carrot up to the cage.

MATERIALS:

Required: snap-together blocks (e.g., Unifix cubes, Snap Cubes, Legos)

Suggested: structural materials such as different kinds of paper and cardboard, paper towel and toilet paper rolls, assorted containers; different materials for the surface of the slide, such as fabrics, foil, plastic wrap; soft or squishy materials for the landing, such as cotton balls or batting, bubble wrap; connectors such as clothes pins, binder clips, rubber bands, tape

PREPARATION:

Designate a starting level for testing, such as a chair, desk, or table. You can make the challenge easier by using a lower surface, such as the bottom shelf of a bookcase, or make it more difficult by using a higher surface, such as the top of a cabinet. Snap three identical blocks together to create a hamster model to show students.

LESSON PLAN:

1. Have students read the passage and discuss the problems they identified. Use these questions as prompts:
 - What do you know about hamsters? Do you have one? Have you seen one?
 - What problems did the hamsters have in trying to get the carrot?
 - Did the hamsters solve any of their problems? How did they solve them?
 - Can you think of better solutions to the hamsters' problems?
2. Introduce the Hamster Slide Challenge by reading through the challenge pages together. Show students the available materials and review the criteria and constraints. Show students the hamster model you created with snap-together blocks and warn them that they should NEVER use real animals in any situation that could be dangerous. Explain that the three-block hamster models will be the same for every team to make testing fair.
3. Give students time to prepare, brainstorm, plan, and build their hamster slides. Circulate to observe and answer questions as students work on their solutions. Remind them to use the challenge pages to guide them as they work through the engineering design process. When they are ready for testing, observe to ensure fair and equal testing conditions for each student or team.
4. Have students share their solutions with the class and get feedback from peers, then revise their designs and test again.
5. When students have completed the challenge, have them demonstrate and explain their hamster slides to the class. Then have them fill out the reflection page.
6. If time, allow students to choose their own problem and testing setup and use the *Universal Challenge Pages* (pages 104–107) to complete their challenge.

NAME: _____

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Directions: Read the passage and underline the problems the characters have to face. Write and/or sketch your ideas for solutions in the margins.

A TASTY MISSION

Sir Fluffsalot and Miss Cookie Cheeks looked out over the landscape of Sam's room. They could see the carrot lying abandoned on the floor near the bed.

"What a tasty treasure," said Fluffsalot as he smacked his lips. "Is there any way we can get to it?"

Cheeks scratched her ear and thought. "We'll have to get out of this cage, down to the ground, and across the mountain of laundry. Then we'll need to find a way to get the carrot back up here."

"Well, first things first," said Fluffsalot. "How do we escape from here? I don't know how to open the door."

"That roof doesn't look to be attached too tightly," said Cheeks. She shimmied up the bars and poked her nose through a space at the top of the cage. "If I can just...oof!" She pushed her head up against the roof, and *POP!* The top of the cage lifted, and she clambered out and down the bars. Fluffsalot wasn't far behind.

As they stood on the edge of the dresser and looked down, they realized they couldn't jump without getting hurt. Cheeks noticed that the back of the dresser was close to the curtains. She jumped onto the curtains, and as she climbed backwards down to the floor, Fluffsalot was right behind her.

Now, they faced a pile of dirty clothes that stretched from the bed to the closet, with no way to go around. The hamsters would just have to go over it. As they stepped onto the mountain of shirts and jeans, it sank beneath them. "This is like walking in deep snow," said Cheeks. By the time they reached the other side of the pile, they were exhausted. As they sat, panting, Fluffsalot suddenly let out an excited squeak. "Look!" he exclaimed. The carrot was close enough to touch, and it was longer than either of them.

"How on Earth will we get it back home?" cried Fluffsalot.

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A TASTY MISSION

“Well, we could just eat it here,” suggested Cheeks.

“If I eat all that, I’ll be too heavy to make it back over the mountain and up the curtains,” sighed Fluffsalot. “But a small taste won’t hurt!” He bit into the tasty, orange goodness.

Then they heard the front door slam, followed by footsteps pounding up the stairs. As Sam burst into the room, the two hamsters froze. At first, Sam didn’t notice them. She threw her backpack on the desk and ran back down the stairs.

“That was close,” warned Fluffsalot. “She’ll be back.”

“What should we do?” worried Cheeks.

Fluffsalot sank his teeth into the end of the carrot and pulled, but it wouldn’t budge. “Mcome mhelp mme,” he mumbled. Both hamsters bit and tugged and yanked, but the carrot stayed put.

“It’s no use,” huffed Cheeks. “We’d better just run for it.” Both hamsters took off running.

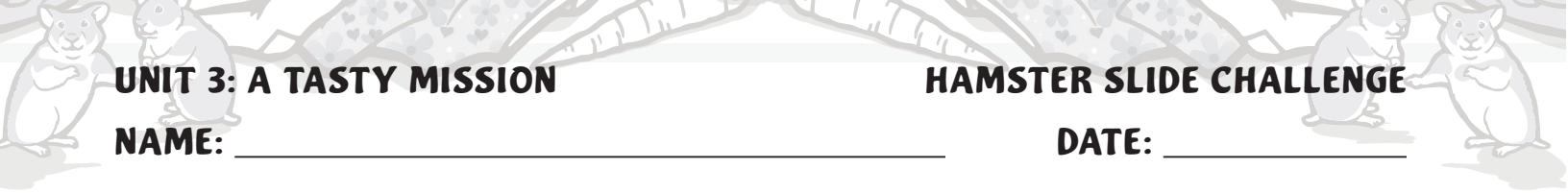
Too late! “Hey! What are you two doing out?” Sam set her snack on her desk and quickly scooped up a hamster in each hand. She carried them to their cage, gently put them inside, and pushed the top back down. She set a book on the roof so they wouldn’t be able to escape that way again.

“Well,” sighed Sir Fluffsalot, “we tried.”

Miss Cookie Cheeks looked defeated. “Such a waste of a beautiful carrot,” she mused.

“Whoa,” Sam exclaimed. “How did this get here?” She picked up the carrot and examined it closely, but she didn’t notice the little bite marks. She crossed the room, lifted the book and latch on the hamsters’ cage, and plopped the carrot in. Then she finished picking up her clothes and bolted out the door.

As Cheeks and Fluffsalot gnawed their way through the delicious, healthy treat, they realized they were very lucky hamsters.



NAME: _____

DATE: _____

STEP 1: PREPARE FOR THE CHALLENGE

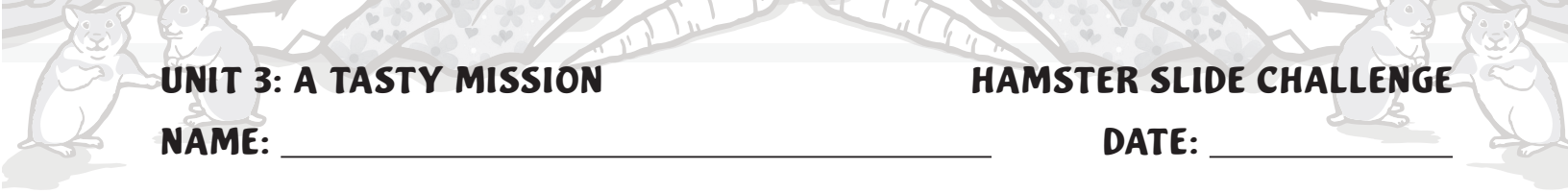
Problem	Challenge	Criteria	Constraints
What problem will you solve?	What will you do?	What should the solution do to be successful?	What are the limits?
The hamsters need to get from the top of the dresser to the floor quickly and safely.	Build a slide for the hamsters and give them a safe landing.	- The hamster model (three interlocking math manipulative cubes) should slide smoothly down from the starting level to the floor. - There should be a soft landing at the bottom of the slide.	- Use only the materials given. - The hamster model can't slip off the sides of the slide.

Your hamster slide will need to do two things:

1. The slide should be **steep** enough and **slippery** enough for the hamster model to slide all the way down without help.
2. Give the hamster model a place to land safely at the bottom without getting hurt.

Directions: Look over the available materials. Think about which materials you might use to accomplish each task. Sort the available materials by task in the columns below. Some materials may work in more than one category.

What materials can you use to build the slide structure?	What materials could you put on the slide that will help the hamster model slide smoothly?	How could you give the hamster model a safe landing at the bottom of the slide?



NAME: _____

DATE: _____

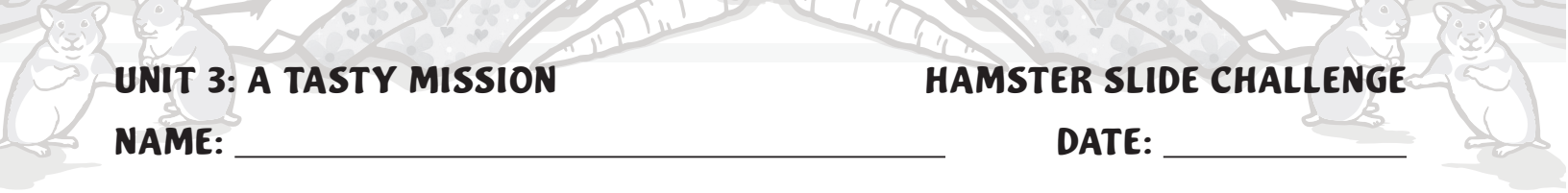
STEP 2: BRAINSTORM, PLAN, AND BUILD

1. Brainstorm design ideas for hamster slides you can build that will meet the criteria and constraints. Sketch and write at least three ideas on the back of this page. Don't forget to give the hamster model a safe landing!
2. Think about which design might perform best in testing. Draw a star by the design you will build. Why did you choose this idea?

3. Draw a diagram of your design here. Label all of the materials.

4. Describe how your hamster slide will work.

5. Build your hamster slide!



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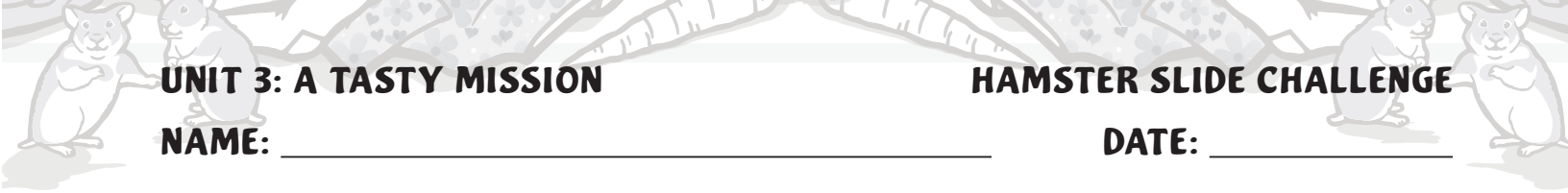
STEP 3: TEST, IMPROVE, AND SHARE

1. Test your hamster slide at the testing station. Did your hamster model go all the way down without stopping? If not, how could you improve your design?

2. Did your hamster model land safely? If not, how could you improve it?

3. Share your hamster slide with classmates. How can you use their ideas to make it better?

4. Keep testing and improving until your hamster slide passes the test!



NAME: _____

DATE: _____

STEP 4: REFLECT

1. How does your design keep the hamster model sliding all the way down?

2. How does your design help the hamster model land safely?

3. How did you improve your design?

4. What was the hardest part about this challenge?

5. What have you learned from this challenge?