Gr. 3 - Understanding Matter & Energy

Forces Causing Movement

Jitter Critter

Specific Expectations:

2.1 Follow established safety procedures for science and technology investigations.

2.2 Investigate forces that cause an object to start moving, stop moving, or change direction.

2.3 Conduct investigations to determine the effects of increasing or decreasing the amount of force applied to an object.

3.1 Identify a force as a push or a pull the causes an object to move.

3.2 Identify different kinds of forces.

3.3 Describe how different forces applied to an object at rest can cause the object to start, stop, attract, repel, or change direction.

3.4 Explain how forces are exerted through direct contact through interaction at a distance.

3.5 Identify ways in which forces are used in their daily lives.

Big Idea (for lesson):

Students investigate the forces causing movement by building a widget whose state of motion depends on the competing forces of friction and gravity. Students will describe the nature of both the forces themselves and the resulting motion.

Accommodations:

- ☒ Increase time
- ☒ Visual Aids
- ☒ Manipulatives
- ☒ Chunking
- ☒ Step-by-Step
- ☒ Scaffolding
- ☒ Copy of Notes
- ☒ Student Grouping

Differentiated Instruction:

- ☒ Content: Use demo to show the content as you offer verbal descriptions.
- ☒ Process: Have students work in pairs and support each other if physical impediments exist.
- ☒ Product: Students may show their final product in pairs, and communicate their findings either verbally, visually, or through written means.
- ☐ Other: _____

Bloom's Taxonomy:

- ☒ Knowledge
- ☒ Comprehension
- ☒ Application
- ☒ Analysis
- ☐ Synthesis
- ☐ Evaluation

Multiple Intelligence:

- ☒ Verbal/Linguistic
- ☒ Logical/Mathematical
- ☒ Visual/Spatial
- ☒ Bodily/Kinesthetic
- ☐ Naturalist
- ☐ Musical/Rhythmic
- ☒ Interpersonal

☒ Intrapersonal

Delivering The Lesson:

Portion & Timing	Grouping:			Introduction:	Materials
Minds On: **10 mins**	W ☒	S ☐	I ☐	Teacher can do a demonstration to introduce friction and its effect on movement for the lesson; either watch the video or do the demo in-person. Ask students (without showing the whole video) why they think the bottle did or didn't move? (*Answer: there was more rice in one bottle to rub against the chopstick and prevent it from sliding*.) Ask students if they think friction is useful, and if they can come up with any situations where friction would be bad.	Jitter-Critters – Floating Rice Trick – Cool Science Experiment.mp4 2 – Plastic bottles 2 – Chopsticks Rice 2 – Beakers
Action: **15 mins**	W ☒	S ☒	I ☒	Have students build their own jitter-critters according to the instructions on the handout. Teacher can circulate and ask questions of the different groups: -Do you think friction is involved with this situation as well? (*Answer: Yes, friction stops the critter's movement down the pole.*) -Can you describe the jitter-critter's motion using scientific language? -What makes the jitter-critter fall again? (*Answer: The force of gravity down on the critter*) -If you loosen the coil, what do you think will happen? (*Answer: There will be less rubbing and less friction, meaning it will fall more quickly.*) -What happens if you tighten the coil? (*Answer: there will be more friction, and the critter will either stay put or fall more slowly.)*	Jitter-Critter Handout (Materials listed)
Consolidate: **10 mins**	W ☒	S ☒	I ☐	Have the students compare how quickly their jitter-critters fall, and discuss whether friction or gravity is the stronger force at play. Make a T-chart on the board and have students suggest situations where it would be ideal for friction to be greater (ie. running	

				shoes) and situations where it would be better for friction to be lessened (ie. the bottom of skis).	