BETHANY LUTHERAN COLLEGE

Science Lesson Plan

Name: Morgan Schwarz **Date:** April 5th, 2016

Time needed: 20 minutes

Subject: Physical Science **Grade:** 5th grade

Topic: The Force of Gravity-- Questioning Strategies (Involvement)

Approved by Cooperating Teacher _____

Science Standards (MN) that this lesson will address:

- Note: There were none noted in the MN standards. I firmly believe this is a lesson that should be taught in the elementary grade levels.

A. Objectives / Learner Outcomes (knowledge, attitudes, skills)

"At the completion of this lesson, learners will …" (Remember to use observable /measurable terms + strong verbs.) Label as COGNITIVE, AFFECTIVE or PSYCHO-MOTOR

COGNITIVE/PSYCHOMOTOR: During the lesson, given the apprpriate materials and guidelines, students will be able to predict and test their prediction (hypothesis).

AFFECTIVE: At the completion of the lesson, given the appropriate objects, students will be able to confirm that weight may not affect the way at which an object falls.

AFFECTIVE: At the completion of the lesson, given the appropriate writing prompts, students will be able to distinguish how gravity relates to the world around them and their everyday life.

B. Assessment Plan:

(How will you know that the learners met the objectives? What will you be able to observe and measure? What percentage of the class will be meeting your objectives? Incorporate this plan into the Input section of the lesson.)

- Observation
- Participation
- Assess the accuracy of their work and following of directions
- Ability to think critically

C. Multiple Intelligences: Select one primary(p), one secondary(s), and (x) for others

__s__ verbal linguistic	__x__ musical/rhythmic	__x__ visual/spatial
____ logical/mathematical	____ interpersonal	____ intrapersonal
__p__ bodily/kinesthetic	____ naturalistic	

D. Materials/Equipment needed:

- Feather
- Baseball
- Ping-Pong ball
- Paper
- Marbles

E. Essential Vocabulary

- gravity
- force
- push
- pull

F. Accommodations for Exceptional Learners (those who have difficulty, ELL/ESL/LEP, LD, gifted, etc.)

- Student that reads below grade level: Review directions as a class, go over vocabulary/materials as a class, hold up objects as we review them before the experiment
- Student with attention issues: Call on this student regularly to keep them motivated and engaged in the lesson. Use this student for demonstrations and examples.

G. Lesson Planning of Teaching/Learning Activities:

1. Anticipatory Set/Focusing Event/Introduction **(How will you grab and focus students' attention in order to introduce the lesson?)**

Tell the students they are going to pretend to go on a bike ride and they need to listen carefully as you describe the terrain and respond appropriately.

"It is a nice spring day—great for a bike ride. You put on your helmet and pull your bike to the end of the driveway. You carefully climb onto your bike. After looking both ways, you start pedaling and turn right onto the road. The road is nice and flat for awhile. Now, you are approaching a small hill. To get to the top you have to push a little harder and faster on your pedals. The road levels off and then disappears. You suspect that the road goes downhill. You are correct. It is a long gentle slope. As you go down the hill, you can coast instead of pedal. You turn right at the bottom of the hill where the road flattens out. A nice steady even pedaling keeps you going at a constant speed. You spot a steep ravine up ahead. As you approach, you sigh before starting downhill. You have to apply the brakes to prevent yourself from going too fast. As soon as you reach the bottom, you start to climb uphill. It is so steep; you have to pedal really hard and fast. Once on top, you stop to catch your breath. The flat terrain is inviting. You pedal along at a steady speed. You turn left at the corner and continue your steady pedaling until you reach your friend's house. You turn left into their driveway, stop, get off your bike, lean your bike against the wall, and take off your helmet."

What would you tell your friend about your bike ride and the effect of gravity as you went up and down the hills?

2. Input: Outline of instruction steps/strategies/modeling (written like a recipe)

1. Instruct the students to stand on the seat of the chair. On the count of three, instruct the students to jump off the chair and then jump back up onto the seat of the chair. Discuss which was easier: jumping off or jumping back onto the seat of the chair? Why is that?
2. On the board write, "If I dropped a baseball and a marble, which one would hit the ground first and why?" Total time: 5 min.
3. After the timer goes off, ask the students to voice their thoughts on the question. Do not tell them if they are right or wrong, but demonstrate and let them decide how right or wrong they are. Stand on a chair and tell them that you are all going to find out which will hit the ground first, the baseball or the marble. Holding the objects about shoulder high, drop them. Ask students if one hit the ground before the other or if they hit the ground at the same time. After hearing several answers, repeat the experiment so that they can see that they both hit the ground at the same time. Total time: 3 min.
4. Pass the objects around and ask students, "That was kind of odd don't you think? I mean the baseball is heavier than the marble; isn't it?" Students will confirm that that is the case. Pretend to ponder this and say, "I think we need to experiment and see if this happens with other objects."
5. Hand out the data collection sheet and read the directions aloud as they read silently.
6. Check for understanding.
7. Answer any questions that they may have.
8. Allocate approximately 10 min for the experiment. Total time: 10 min.
9. After the experiment is over, have students report if their predictions were correct or otherwise. Ask them to look at their experiment and see if they could identify why some objects hit the ground before others. Example, the unfolded sheet of paper will the ground much later than the Ping-Pong ball, but once the sheet of paper is crumpled into a ball, they both hit the ground at the same time. Ask why this might happen. Steer the discussion in the direction that while weight may not affect the rate at which objects fall, shape certainly does. Ask the students to explain why this might occur.
10. Ask, "does gravity change?" Answer them carefully, but explain that **gravity remains constant.** Ask, "when the wind is blowing really hard, what's the easiest way to walk into the wind? Do you bundle up (demonstrate wrapping yourself up and hunching down as you move forward) or do you spread your arms wide and try to walk into the wind? Which will make it easier more me to move?" Take answers. They will mention that if you huddle up and hunch over that it will be easier to walk than if you spread your arms out. Ask them to explain and you will get answers such as; when you spread your arms out, the wind hits more of you-like a kite and makes it harder to walk. Agree. Hold up a crumpled piece of paper and an unfolded sheet and ask, "pretend that this piece of paper is a person. Which one of these

will make it to the ground more easily?" The crumpled one because there is less air hitting it. Total time: 10 min.

11. "Why is it important to know about gravity?" Take answers and write them on the board. Explain that gravity helps us move, float, fly, and grow plants. Explain that understanding how much gravity has will determine how we work, travel, and grow plants. Total time: 5 min.
12. Check for questions and assign the journal topic, "How does gravity affect my everyday life? How would it be different if there was no gravity?"

3. Guided Practice Activity (How will the children practice as a class or small group under your watchful eye?)

- See above- Embedded within outline
    - Discussing directions
    - Reading through the directions as a class
    - Full-group discussions

4. Evidence of Learning: ***How will you know when the learners have reached the objectives? What will a successful outcome look like? (Refer to your assessment plan)***

- Journal response
- Worksheet
- Partcipation

5. Closure and Independent Practice for transfer/extension of learning (What will students do now that the lesson has been taught?)

Finish the journal entry for tomorrow. Come prepared tomorrow to learn about Newton's Law of Physics!

H. Evaluation/Reflection of Teaching/Learning: (By the student teacher —How did I teach? What did I learn about my teaching/students? What specifically do I need to work on for improvement? Etc.)

- Very impactful!
    - Even as college students, this was a fun activity as some people didn't realize the effect of gravity on different objects which weighed differently
- Hands-on learning is fun for the students and gives the teacher a chance to evaluate the students and assess
- I would have the activities spread around the classroom if there were more students
- More than 1 of each type of object if there were more students
- I need to work on giving clear directions to the students
    - Do not assume that they know it even if it is common sense
- Journal responses can be a vital tool to gauge where the students are at
    - Do I need to review this tomorrow?
    - Do I need to re-teach this tomorrow?

- Can I move on to another topic/something more advanced?