Science Lesson Plan Template
Date: _____

Grade: 3rd	**Subject: Science**
Materials: **Explain:** • **Pulley** • **Scissors** • **Tongs** • **Ramp** • **Ball** • **Pizza cutter** • **X 22 observation sheets** **Explore** • **X 3 scissors** • **X 3 ball and ramp** • **X 3 pencils (simulate a wedge for safety)** • **X 3 pulleys** • **X 22 experiment sheets**	**Technology Integration:** Most of this lesson is hands on and interactive so there is limited technology integration. The projector and active board will be used however to display the video and PowerPoint slides.
Standard SCI-EL.ETS1.02 - Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. Performance Standard 3-PS2-2 Make observations and metric measurements of an object's motion to prove that a pattern can be used to predict future motion.	**Differentiation Needed:** **-**For students on a behavior plan, this lesson requires teamwork and collaboration, and so consideration may need to be made for groupings. - This lesson does require students to independently read the scenarios and so some students may need assistance reading the passage. - Consideration will also need to be made for directions. I will try to make sure all directions are always visually posted and stated clearly for all students to see.
Objective By the end of the lesson, students will apply their knowledge of simple machines to design a solution to a real-life scenario. By the end of the lesson, students will identify patterns in motion for four types of simple machines by writing down observations. **Bloom's Taxonomy Cognitive Level: Apply, identify, design**	

Safety Plan

- **Lesson specific safety concerns**
- During this lesson, some materials (the pizza cutter and scissors) may be dangerous for students and so careful consideration should be made for where these materials are placed and how they are used.
- **Student Movement**
- Students will have the opportunity to move throughout the lesson. During the explain, they will be actively writing and participating in the guided practice. During the explore, they will have the opportunity to move around the room. Also, during the explore, students can stan, sit, or move around as they brainstorm as long as they are doing so politely.
- **Plan for handing out materials.**
- Partner cards: I will pass these out to ensure groups are made correctly.
- Observation sheet: Students can grab from five piles at the front of the room as they move from their desks to the carpet space at the front.
- Experiment sheets: Will be placed before class at each station as well as the materials needed for the station.

Minutes	**Procedures**
30	**Set-up/Prep before lesson:** Before the lesson, I will need to create the observation and experiment sheets. Also, the partner cards will need to be cut out and organized. This lesson will take place after a special and so I will need to make sure the visual aides are pulled up, and the stations are all set before the students arrive.
5	**Engage: Phenomena** To begin our science lesson today, lets watch this video to see how simple machines can work together to create an awesome chain reaction! https://www.youtube.com/watch?v=GEzcO3nfjZk In this video, we saw a ton of simple machines working together, but I wonder, how did the person making this chain reaction know how each simple machine would move? Today students, we are going to work together to answer that question!

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	Now, can you all please get out your science journal, a pencil, a glue stick, a clipboard if you would like, and come meet me at the front of the room. Once you are at the front of the room, please grab one of these observation sheets and quickly glue it into your science journal.
10	**Explain: (teacher-led)** Once all students show they are ready, I will continue. Students, I know you have been learning a ton about simple machines over the last few weeks, and today we are going to put all that learning to the test. Today we will focus on four of the six types of simple machines. Before we do, though let us review what you already know. I am going to show you three examples of each type of simple machine and using the observation sheet I just gave you; I want you to write down any patterns that you see in the movement. (After I show each set if three, we will pause for whole group discussion, think pair and shares, and students writing one observation on the board) Alright class first up are the pulleys. First, lets look at how these two objects move on the PowerPoint. What do you notice? Write down any patterns you see! Now, all eyes on me as a show you a standard pulley. Again, do you notice a pattern from the previous two? Make sure to write down your observations! Pulleys- shown on powerpoint (crane, flagpole) Shown in class (standard pulley) Next, we have levers! I have three objects here in front of me, as I move the scissors what happens? See how the tongs moves in a similar way? Now, I want you all to reach your hand out in front of you, and then lift your hand to the ceiling, just bending at the elbow. I wonder what the pattern is. If you want to draw a picture, feel free for your observations! Levers- shown in class (scissors, human joints (arm), tongs) Now, lets look back up at the board at some picture's videos of a shovel and an axe. This time focus on the object the tool is hitting. What is happening to the ground? Let us think of a pizza cutter, what happens to the pizza when you use the cutter? Is it like what happens to the ground and log? Wedges- shown on PowerPoint (shovel, axe) shown in class (pizza cutter) Finally, we will look at incline planes. First, lets see a ball rolling down and up this ramp. Now, look at how the objects move on stairs and a ladder. What is the same about how the object moves? Does the object change in how far away it is from the ground? Make sure to keep writing down your observations! Incline plane- shown in class (Ball rolling down a ramp) shown on powerpoint (stairs ladder) As we work through these examples, students will either identify on their own or with guided help from the teacher that there are patterns in motion. The teacher will then say, students, you just identified that when you use any example of a simple machine, there is a pattern to how the object sill move. We know this because of Newton's Laws of motion and because of force. Let's look at the incline plane section of your observation sheet. Where is the force acting on the objects? Is it the same across the examples? Yes! And that is why we can see patterns and predict how an object will move in any situation. Now scientists, we have come to the time where you are going to put your skills to the test.
20	**Explore: (concreate practice/application with relevant learning task -connections from content to real-life experiences)** Behind you all, there are three stations that all have the same materials at them. However, there are different situations at each station. You task today is to analyze the situation, and make a prediction based on your knowledge of force and motion how you can solve the problem given to your group. The best part is, there is more than one answer! Once you are split into groups, you can work together, but remember, if you think of two ideas, that is okay! I will then split the students into groups by passing out simple machine designed partner cards. At each station, students, you will find an experiment sheet to fill out as you investigate. Make sure to follow the steps in order and ask any questions you have! You can touch all of the materials in your station but remember to be safe and kind to others. Alright, when I say simple, you say machine, and find your station. (depending on the amount of time in class students may complete 1 to 3 stations) Each station will have an example of each of the simple machines discussed at the beginning for students to look at for inspiration. **Station 1**: Hi! My name is Jim, and I am a carpenter who builds houses. While I was building a house, I had a hard time moving some of the large pieces of the roof off of the ground. Could your team design me a way that I could move pieces onto the roof from the ground? I learn best by looking at pictures, so please do not forget to draw a diagram on your paper! **Station 2**: Hi! My name is Emma, and I am a veterinarian who works with large animals and specifically horses. Sometimes, when an owner brings a horse to me, I need to clean out the bottom of the horse's hoof. Can you design me a simple machine that would break apart the mud and rocks often stuck on the bottom? I learn best by reading, so remember to label your diagram and write a detailed explanation!

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	Station 3: Hi! My name our names are Susan and John. We own a cake decorating business. Sometimes when we are washing all of the dishes after a long day, we think it would be nice if there was a way for us to quickly slide all of the dishes into the sink. Could you design us an object that would help?
5	**Closure (wrap up and transition to next activity):** Alright scientists, I am so excited to hear about how you solved each problem! When I call on your group, please stand, have one person tell us the problem, one person state the simple machine used to fix the problem, one student say the pattern of motion you needed to solve the problem, and one let us know if there was any other ideas your group had. I will give you about thirty seconds to decide the roles. Ready, go! (I will have the roles on the board for the students to see) Students will then share their findings, and the class will discuss briefly with the students. After the discussion, I will ask the students to think in their heart if during the lesson today, they were able to learn, work with others, and have fun. It will be important for students to not share but to just do a short self reflection of their behaviors and learning throughout.

Formative Assessment: (linked to objective, during learning)	**Summative Assessment (linked back to standard, END of learning, NOT on the same day of instruction)**
• **Progress monitoring throughout lesson (document of student learning, data collection)** At the end of this lesson, I will be able to collect both the observation sheet and the students experiment sheet for formative assessments. These two activities should show growth and different skills for each student. Also, as students are working, I will be walking around to answer questions and gain an understanding of how they are doing. I will grade the observation sheet as completion. Does the student notice a pattern in each category? Yes or no. The experiment sheet will be graded on the students ability to use their knowledge of simple machines and problem solving to answer the question given in the scenario. Students will also be graded on their ability to work well with their classmates.	At the end of the unit, student will take a summative assessment that asks students to identify the types of simple machines as well how the machines move.

Teacher Reflection (What went well? What did the students learn? How do you know? What changes would you make?):

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Name_____

Simple Machine	**Observations/Patterns**
Pulleys	
Levers	
Wedges	
Inclined Plane	

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Station Number:	Name:
What is the problem?	How will the objects move?
What simple machine did you use?	Draw and label a diagram
Will your design work? Does it help the person? How?	

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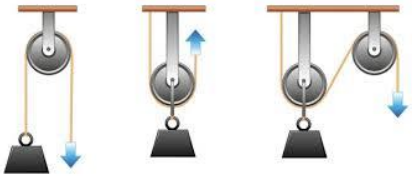
Summative Assessment:

Directions: Label the simple machine and then draw a predicted motion that the machine could make

Name_____

Simple Machine | How does it move?



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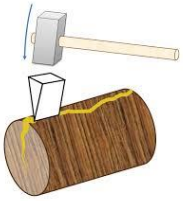

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Partner Cards

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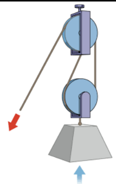		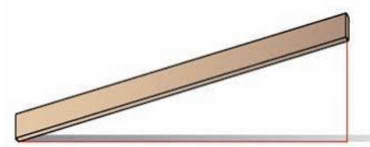
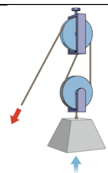		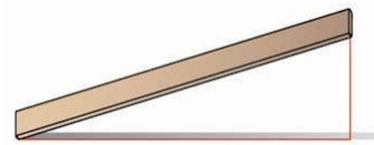
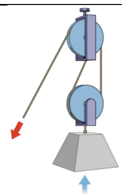		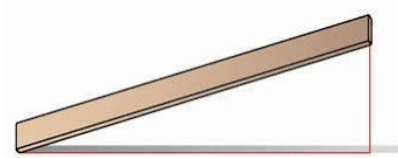
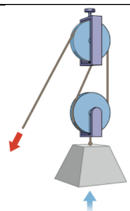		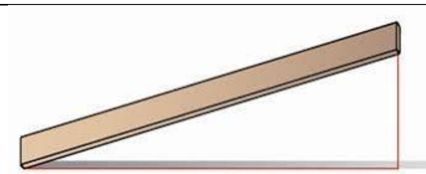
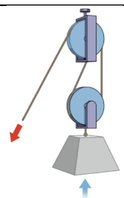		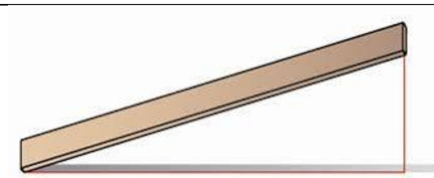
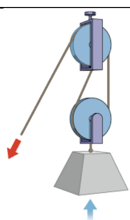		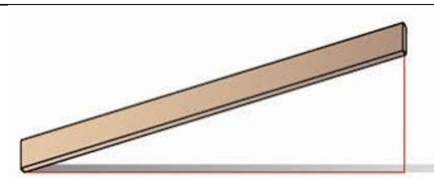
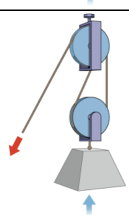		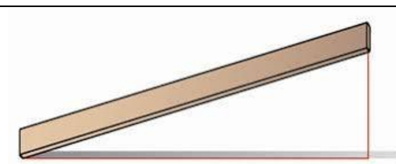

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