Teacher Work Sample

Spring 2017

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1. Learning Context:

School District: Juab School District
School: Mona Elementary
Title 1 School: Yes
Demographics:
Mona Elementary School is one of three elementary schools in Juab School District. It is located in Mona, Utah, which has a population of 1,569. Additionally, many students who attend this school come from the nearby town of Rocky Ridge, Utah, population 403. Students from this neighboring area come from large families that are part of a religious sect known as the Apostolic United Brethren (AUB). This is a fundamentalist group that promotes polygamy. There is not a lot of ethnic diversity in this rural area as reflected in this data collected from the 2015-2016 school year. *Resource: Data Gateway, Utah State Board of Education
Students at Mona Elementary School performed slightly above the district average on the standardized SAGE tests, and slightly higher than the state average in math and science during the 2015-2016 school year. *Resource Data Gateway, Utah State Board of Education.
Description of school climate:
Mona Elementary School has its own theme, motto, mission statement and beliefs. All of these emphasize positivity and success! The theme is “Be Amazing!” The Motto is “Questing for Quality.” And the Mission statement is “…To provide focused instruction to ensure all students achieve high levels of academic and social success.” The official school beliefs as provided in the employee handbook focus on: providing quality instruction and engagement for students, promoting a safe and respectful learning environment as well as embracing every student and addressing their individual needs.

At Mona Elementary all staff members work as a team to support one another and to ensure success. Teachers meet in weekly Professional Learning Community (PLC) meetings to coordinate grade level learning goals and objectives. During these meetings all teachers work as a team to complete a PLC document that is then sent to the principal. This document outlines weekly goals, identifies areas of concern and relates information of students who may need additional support both inside and outside the classroom. Teachers also meet weekly with their instructional assistants (aides) to monitor student progress and plan for instruction. In my short time at this school I have seen and experienced how cohesively the staff operates. I believe that this is due to a strong support system provided by the school principal Mary Wohlforth. Each person who works and/or volunteers at this school feels like a valuable member of the Mona Mustang team.

This school takes part in a district wide goal to address personalized learning for each student through four core essential elements. According to information provided by Juab School District, the four elements are: Integrated Digital Content, Targeted Instruction, Student Reflection and Ownership and Data Driven Decisions. Teachers at Mona Elementary are always striving to improve their methods of instruction and are working hard to follow this model they call “blended learning.” Some of the ways that teachers are using this model is by using programs and apps that differentiate academic content and collect data. Two of the programs used throughout the school are iReady and Mastery Connect. Additionally, many teachers are using small group instruction in math and reading to ensure that the needs and progress of all students are monitored daily.
Grade Level: 3rd and 4th (Teacher: Student Teacher)

This class is a combined third and fourth grade classroom. The split was done in response to a growing number of students in the third and fourth grades. In 3rd grade there are 13 students and in 4th grade there are 11 for a total of 24 students. Because this teacher uses blended learning and instructs math and reading in small group rotations, each student still receives grade level appropriate content. Mrs. Blackett made her curriculum map to ensure that she addresses all grade level CORE standards; she did this by comparing the two grade level standards side by side. In each subject area, Mrs. Blackett compared the standards and found that many of the learning goals for third and fourth grade are similar. In her whole group lessons she incorporates both grade level expectations and as a result many of her third grade students have already mastered both third and fourth grade standards in Language Arts. Although the split does require a lot of planning and collaboration with other staff members, I believe that students are generally performing to the high academic expectations that Mrs. Blackett has set.

Classroom Environment and Management:

Each day students are welcomed by Mrs. Blackett at the door and come into the classroom to mark their lunch choice and attendance on a magnet board. Students then gather supplies they will need for Daily 5 (Reading groups) and wait for rotations to begin by silent sustained reading. Students also work on their various classroom jobs that are assigned weekly to the tables they sit at. After Daily 5 rotations are complete, students meet at the “rug” for a Morning Meeting during which they recite the class creed. This creed tells a lot about the type of classroom environment and management that Mrs. Blackett promotes: I am smart. I am unique, and I am important. I can and will make a difference in the world. I can be respectful, responsible and caring. I make mistakes so I can learn, I learn so I can succeed and I succeed so I can help others. Each day I’ll do my BEST and won’t do anything LESS. I believe in myself! As part of Mrs. Blackett’s class, we know that we are loved. We pledge to come ready to learn, have fun and succeed. We will spread sunshine to those in need! Most importantly, we work as a TEAM!! Mrs. Blackett’s class operates on one rule: RESPECT. Mrs. Blackett makes sure to review what this means with students frequently during
Morning and Closing Meetings. During these meetings students also give each other compliments, share things they learned, address their concerns and get feedback from their teacher on their behavior and more.

One thing that is apparent in this classroom is that the teacher reinforces the positive and creates trusting relationships with students. That positive reinforcement strategy intrinsically motivates everyone to try harder and do better! The best strategy that Mrs. Blackett uses is emphasizing the positive and ignoring inconsequential behaviors (or addressing those behaviors in a non-demeaning way.) Students in this classroom feel valued, validated, positive and respected because they are praised and noticed frequently for specific positive behaviors and achievements. Mrs. Blackett also uses a random rewards “fuzzy” system, which is a whole class motivator. Students are given “fuzzies” for being kind, being brave to answer a question, for raising their hand to speak and for other types of positive behaviors. This class does not rely on extrinsic motivation, yet this strategy is used as an additional “fun thing” that students can earn. Once the “fuzzy” jar is filled, students can vote on how to spend the time that they’ve earned. Lastly, to promote good teamwork behaviors Mrs. Blackett has a student write “Together we work as a TEAM” on the board before math and reading rotations. This strategy encourages students to stay on task and work quietly during small group work. If students are off task or being noisy, a letter is erased from TEAM but students are always given a chance to earn the letters back. At the end of each center, students can earn time for keeping TEAM on the board. This time can be used for a fun game during PE or time spent with the class pet (Lily the chinchilla).

**Learning accommodations:**
In this class there is a small group of students who attend a daily BURST group. This reading group provides additional reading instruction and research validated interventions. Victoria, Brody, Kyra and Kolsen all leave class from 9-9:30 every morning to meet with their BURST instructor. This reading instruction is provided in addition to the guided reading instruction they have in class.

There are two students in this class that have IEP’s. Kyra and Kolsen both meet with a specialist Mrs. Nielsen for reading and math each day. This specialist keeps Mrs. Blackett informed of what students are
working on and of the progress they are making.

Both Mrs. Blackett and I provide in-class accommodations to differentiate instruction and assignments for individual learners. Some of these accommodations are: more teacher modeling and scaffolding, longer wait time, group/partner work, different problems assigned and flexible instruction in response to their needs.

**Area of focus:**

**Subject:** 3rd Grade Science  
**Unit:** Force and Motion  
**Total number of students:** 13  
**Students with special considerations:**  
Brody- reading and math skills.  
Danika- reading and math skills.  
Sadie- speech, reading and math skills  
Victoria- speech and reading skills  
**Prior Knowledge:**  
I assessed students’ prior knowledge and any challenges I might have teaching a 3rd grade science unit by having a meeting with my mentor teacher. According to Mrs. B, students have only had intermittent science instruction this year. She does not have a well-planned 3rd grade science curriculum as she has only taught 4th grade before. During the time that 4th graders have science, the third graders get computer lab time or their classroom aide might teach a science unit from the Third Grade Science Workbook. So far, students have only covered Standard 1: Earth, Sun and Moon. This is the only data that shows up in Mastery Connect, the program that is used to assess and track data for each subject and standard. Although students might be somewhat familiar with the scientific method, Mrs. B believes that students will probably not have much prior knowledge of force and motion.

I observed Mrs. B’s 4th grade science instruction. It focuses on the scientific method and during each lesson student's start by reading from the workbook, taking notes and/or doing “research.” Then they formulate a question and hypothesis guided by Mrs. Blackett. Students then observe an experiment or participate in one, analyze and interpret their data and draw conclusions. Mrs. Blackett follows this standard
format for most of her science lessons.

Time is allotted for 4th grade science because the 4th grade teachers do a science rotation. Every Tuesday, Wednesday and Thursday from 1:00-1:45 fourth graders go to science. This would also be the time that 3rd graders could get science, but we will have to go to the East Kiva for lessons or switch off using the classroom with 4th graders.

Unit Development and Planning:

Mrs. Blackett suggests carefully and repeatedly going over scientific vocabulary and even though it might seem repetitive, to take time with each of the concepts because students have not had much science instruction this year. I will use guided notes and group/partner work to provide support for students who need accommodations. I will use technology to engage students, to provide research and information beyond the three pages in their science notebooks and get them involved in activities they might not have experienced before. I will use real life applications to teach force and motion (for example, use their daily activities to illustrate force and motion) and create opportunities for problem solving.

Lesson planning for this unit will be very flexible. I will only plan one-week worth of lessons at a time so that I can differentiate instructional methods and timing based on students needs. Depending on the information I get from the formative assessments that I will use, I may need to adjust time and lessons for students to get used to the new instructional methods, lesson formats, assignments and content.
2. Lesson Plans

**Summary of Unit**

**Unit Theme:** Force and Motion  
**Subject:** Science  
**Grade Level:** 3rd

**Lesson Plans:**  
Lesson 1 Force and Motion  
Lesson 2 Force and Mass  
Lesson 3 Review and Fluency Practice

**Core Standards:**  
Standard 3  
Students will understand the relationship between the force applied to an object and resulting motion of the object.

Objective 1  
Demonstrate how forces cause changes in speed or direction of objects.  
- a. Show that objects at rest will not move unless a force is applied to them.  
- b. Compare the forces of pushing and pulling.

Objective 2  
Demonstrate that the greater the force applied to an object, the greater the change in speed or direction of the object.  
- a. Predict and observe what happens when a force is applied to an object (e.g., wind, flowing water).  
- b. Compare and chart the relative effects of a force of the same strength on objects of different weight (e.g., the breeze from a fan will move a piece of paper but may not move a piece of cardboard).  
- c. Compare the relative effects of forces of different strengths on an object (e.g., strong wind affects an object differently than a breeze).  
- d. Conduct a simple investigation to show what happens when objects of various weights collide with one another (e.g., marbles, balls).  
- e. Show how these concepts apply to various activities (e.g., batting a ball, kicking a ball, hitting a golf ball with a golf club) in terms of force, motion, speed, direction, and distance (e.g. slow, fast, hit hard, hit soft).

**Rationale for instructional methods:**  
**Inquiry method:** I will be using the research-validated inquiry based
method to investigate and teach this science topic in the following ways:
- Pose questions about topic for students to consider and discuss
- Allow students to investigate their ideas and opinions
- Review students understanding and clarify misconceptions
- Connect science topics to real life experiences
- Use scientific method for investigations: observe, question, hypothesis, explore/test, interpret results and draw conclusions.

**Academic language/vocabulary:**
- While students are studying the science topic of force and motion, they will gain the vocabulary needed to describe what each concept means. They will then use these definitions and vocabulary in future lessons.
- Students will be assisted in summarizing what they have learned in their science journals through the use of guided notes.
- Students will use their prior knowledge of the scientific method and its steps to complete the learning objectives.
- Students will use what they know about reading fluency and textual evidence to read informational texts and answer questions on the topic.
- Academic Language: Force, motion, mass, hypothesis, experiment, conclusion, data, scientific method

**Technology integration:**
**Use of videos:** students will be watching a variety of YouTube videos to launch this science topic. The videos illustrate the targeted concepts for this unit and make it easier for students to apply the science topic they are learning to their own lives. In these videos students will see demonstrations of force and motion and get clear definitions of each concept. Students will be using carefully created guided notes while watching the videos. The videos will be paused as each of the concepts are discussed as a class and students will be given time complete the guided note worksheets. These guided notes will then be pasted into their science journals so students can refer back to them for review.
**Use of iPads:** Students will use iPads to record their own experiments in this science topic. They will use their recordings to “teach” other classmates their assigned concept by sharing their question, hypothesis, procedures and conclusions. This technology integration is used to engage students, support inquiry method of instruction and as both a
Lesson 1: Force and Motion
Time: 40 minutes
CORE Standard: 3rd grade Science

Standard 3
Students will understand the relationship between the force applied to an object and resulting motion of the object.

Objective 1
Demonstrate how forces cause changes in speed or direction of objects.
   a. Show that objects at rest will not move unless a force is applied to them.
   b. Compare the forces of pushing and pulling.

Learning Objectives:
- Students will be able to define force, motion, rest, push and pull and use their own words to describe each concept.
- Students will understand that motion is the result of an applied force.
- Students will be able to apply their knowledge of force (push and pull) to identify motions at school and play as being push, pull or both.

Materials:
Poster paper.marker
Charades pictures/labels
Laptop or smart board to view videos
Guided notes
Basketball
Science Journals

Procedures:
LAUNCH: 20 min
Engage: Do any of you have ideas on how to get this ball to move? (Kick, throw, hit, push) Great! All of the things you described are types of FORCES we use to get things to move.

Pose these questions for whole group discussion:
- What is a force?
- What happens when you push something? (It moves?)
-Pull something? (It moves?)

Set the purpose:
Today we are learning about force and motion. How things go from staying still to moving! Can you believe that this is actually SCIENCE? You do a lot of science things everyday!! Lets watch these videos and do some guided notes and then we will get to explore!
*Set expectations: we will pause the videos and take notes together, stay with the class and don’t work ahead so you can be sure to get the right answers. Listen carefully! (No talking) all eyes up here- so we can begin!
Watch videos:
https://youtu.be/8iKhLGK7HGk Bill Nye
https://youtu.be/rfeVlnL7d9U Force and Motion
https://youtu.be/HCvbN2P_MCY Push and Pull

Using guided notes students will define:
-Force
-Motion
-Push
-Pull

EXPLORE: 15 mins
*Set expectations: don’t shout out! Raise your hand if you want to share!

Working together we will create a class chart/poster for FORCE: PUSH, PULL or BOTH or REST. We will write a definition on the chart together (look at your worksheet, what does push, pull mean?) then each student will act out a motion (push, pull or both and rest) and the class will help me place pictures of motions on our chart. Charades—students act out the motion I give them. Students will indicate using their whiteboards if the motion is a push, pull, both or at rest. Discuss what the motion is and place it on the chart.

DISCUSS: 5 mins
Review each picture, talk about how it can be push/pull or both.
Give students time to glue their guided notes into their science journals. Let students know that they will keep these notes and use them to study for the test.
Accommodations:
- Students will use guided notes and take notes together as a class. (I will check in regularly with B,V,D and S to make sure that they are staying caught up with note taking. These are the students that need additional support in Language Arts)
- Students will keep their guided notes and glue them into their science journals to refer to before testing
- Students can discuss their ideas in partners for added support

Assessments:
- Whiteboard activity (choosing between push, pull, both or rest) I can assess students understanding formatively.
- Formative assessment of student discussions and contributions to the lesson. (Specifically call on B,V,D and S to check for understanding)
Bill Nye Says:

When something is at or sitting it stays sitting still unless acted on by an outside force.

In your own words:

Nothing gets unless they get or pulled.

An object at stays at rest unless acted upon by an force.

An object in tends to stay in motion unless acted upon by an .

Force and Motion

Motion is from to another.

What makes something move?

There are many ways (forces) you can use to get things to move. What are some ways you saw in the video?

Push and Pull

Pushing moves things.

What is one example of a pushing motion from the video?

Pulling moves things.

What is one example of a pulling motion from the video?
Charades Cards for Force and Motion:

- Shooting Hoops
- Drinking from a water fountain
- Writing with a pencil
- Going down a slide
- Typing on a keyboard
- Putting on a seat belt
- Getting a book off of a shelf
- Hugging someone
Opening and closing a car door

Student sitting at their desk.

Playing jump rope

A basketball

Swinging

A Book
Lesson 2: Force and Mass
Time: 3-Day lesson 40 minutes each (with technology integration)
Lesson Plan: (ideas)
http://www.uen.org/Lessonplan/preview?LPid=10038
http://www.uen.org/Lessonplan/preview?LPid=3195

CORE Standards: 3rd Grade Science
Objective 2
Demonstrate that the greater the force applied to an object, the greater the change in speed or direction of the object.
a. Predict and observe what happens when a force is applied to an object (e.g., wind, flowing water).
b. Compare and chart the relative effects of a force of the same strength on objects of different weight (e.g., the breeze from a fan will move a piece of paper but may not move a piece of cardboard).
c. Compare the relative effects of forces of different strengths on an object (e.g., strong wind affects an object differently than a breeze).
d. Conduct a simple investigation to show what happens when objects of various weights collide with one another (e.g., marbles, balls).
e. Show how these concepts apply to various activities (e.g., batting a ball, kicking a ball, hitting a golf ball with a golf club) in terms of force, motion, speed, direction, and distance (e.g. slow, fast, hit hard, hit soft).

Learning Objectives:
Students will explain that size and mass are not the same, each means something different.
Students will demonstrate how an objects mass affects its force.
Students will demonstrate how an objects mass affects the force needed to move it.
Students will demonstrate that an object with a larger mass (and force) will make a lighter object stop or change directions.
Students will demonstrate that objects with equal mass and force will react the same when they collide.

Technology integration:
Students will use iPads to record their experiments. They will “teach” other classmates their assigned concept by sharing their question, hypothesis, procedures and conclusions. This technology integration is used to engage students, support inquiry method of instruction and as
both a formative and summative assessment as students record and present their work.

**Materials:**
Balloon/golf ball
Ping-pong ball/golf ball/flicking with force chart/ruler
Various matchbox cars/crash chart
Washers (or bolts)/wind up truck
Scientific method worksheet/experiment instructions
iPads (for recording)
iPad recording checklist
Smart board/projector for sharing videos
Science journals

**Day1:**

**Procedures:**
LAUNCH: 10 mins
Pose questions for students to consider:
- What is mass? Any ideas?
- Does size mean the same thing as mass? (Compare a balloon to a golf ball - which one would be heavier? But which one is bigger?) and then demonstrate.
- How does mass affect how much force you need to use to get the object to move? Any ideas?
- What happens when there is unequal mass? Any ideas?
- How do objects stop, start or change direction? Any ideas?

Let’s do a few experiments to answer these questions!

EXPLORE: 30 mins
We will experiment using the scientific method to test the relationship between force and mass.
Students will work in groups to answer a few different questions. Each group will have a different question/experiment and a worksheet with instructions and to record their data. The groups will record themselves making predictions, performing the task and what they learned. We will watch it as a class.

*Set expectations for teamwork
1. Pair into groups of four quickly
2. Read the directions and problem together- don’t work ahead of your team
3. Share the work equally
4. Whisper level

**Group 1: Flicking with Force!**
Answer the question: Does the amount of force change how far an object will move? Does the mass of an object have an effect on how far an object will move?

Materials: golf ball, ping-pong ball, ruler, and chart

Procedures:
1. Hypothesis - Which ball will go farther and with how much force (soft or hard) and why?
2. Test it! - Complete the chart by flicking the ping-pong ball/golf ball with a soft, and hard flick. Do one at a time and record how far the ball moved (in centimeters) on the chart.
3. Conclusion - Answer the questions:

* Which ball produced the greater direction/distance and why?
* Did the balls move farther when a greater or lesser force was applied to the balls?
* What does weight (mass) have to do with force?

**Group 2: CRASH COURSE!**
Answer the question: Does the mass of an object have an effect on its force when it collides with another object? What if one object has more mass or both objects have equal mass?

Materials: different sized cars/trucks with different masses, chart

Procedures:
1. Hypothesis: Predict what will happen when each car/truck collides on the chart. (Write your prediction)
2. Test it - Complete the chart and record what happens when each car/truck hits one another head on. One student will sit on one side of the hall, another student on the other side and push the cars towards one another with medium force.
3. Conclusion - what effect does the mass of an object have on its force? What happens when two objects with unequal masses collide?

**Group 3: What A Load!**
Materials: wind up truck, washers
Procedures:
1. Hypothesis: Predict what will happen to the distance the car goes as more washers are added to the load. Predict how many washers will make the car unable to move.
2. Test it:
   - Wind-up on the toy and let it go. Observe the distance traveled before the toy stops moving.
   - Place four washers on the paper clip, repeat. Compare how far the car went to last time.
   - Place six washers on the paper clip, repeat. Compare how far the car went to last time.
   - Place eight washers on the paper clip, repeat. Compare how far the car went to last time.
   - Repeat step four, with two additional washers on each new run, until the toy cannot move the weight. Compare the results of each run with previous runs.
Discuss what is happening in this experiment with your group.
3. Conclusion: Does increased mass/weight make it more difficult to move an object? If the force stays the same but the mass increases will an object slow down?

DISCUSS: 10 mins
Check that all students completed the assigned worksheet. Have students clean up and return their materials. Groups check in with their partners to make sure all portions of the experiment and worksheet are finished. Take this time for groups to complete the “Conclusion” portion of the worksheets and talk about what they learned (so they can prepare to record it tomorrow).
**Group 1: Flicking with Force!**

**Materials:** golf ball, ping pong ball, ruler and recording chart

**Question:** Does the amount of force change how far an object will move? Does the mass of an object have an effect on how far an object will move?

**Hypothesis:** which ball will go farther the golf ball or the ping pong ball and with how much force (soft or hard) and why?

**Test it!:** Complete the chart by flicking the ping-pong ball and then the golf ball with a soft, and hard flick. Do one at a time and record how far the ball moved (in centimeters) on the chart.

**Conclusion:** Answer the questions as a group:
* Which ball produced the greater distance and why?

* Did the balls move farther when a greater or lesser force was applied to the balls?

* What does weight (mass) have to do with force?

**RECORD:**
As a group, you will be recording what your question, hypothesis, experiment and conclusion was. What did you learn? You can include your charts and what you've written on your worksheet as part of your video!
<table>
<thead>
<tr>
<th>Golf Ball</th>
<th>Ping Pong Ball</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Soft Flick</th>
<th>Hard Flick</th>
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</thead>
</table>

Greatest Distance

Measured in cm.
**Group 2: CRASH COURSE!**

**Materials:** different sized cars/trucks with different masses, chart

**Question:** Does the mass of an object have an effect on its force when it collides with another object? What if one object has more mass or both objects have equal mass?

**Hypothesis:** Predict what will happen when each car/truck collides on the chart.

**Test it:** Complete the chart and record what happens when each car/truck hits one another head on. One student will sit on one side of the hall, another student on the other side and push the cars towards one another with medium force.

**Conclusion:** Answer the questions as a group:
*What happened when two objects with unequal mass hit each other?*

*What happened when two objects with equal (the same) mass hit each other?*

*What effect does the mass of an object have on its force?*

*How can an object change directions or stop?*

**RECORD:**
As a group, you will be recording what your question, hypothesis, experiment and conclusion was. What did you learn? You can include your charts and what you’ve written on your worksheet as part of your video!
<table>
<thead>
<tr>
<th>CRASH COURSE CHART</th>
<th>Name:</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td><strong>I Predict....</strong></td>
<td></td>
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<td></td>
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<tr>
<td><strong>What Happened...</strong></td>
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<tr>
<td><strong>Purple Van</strong> Vs. Blue Car</td>
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<td>Mass: Heavy and Light</td>
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<td><strong>Green Truck</strong> Vs. Red Truck</td>
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<td>Mass: Equal Heavy and Heavy</td>
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<tr>
<td><strong>Red Car</strong> Vs. Orange Car</td>
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<tr>
<td>Mass: Equal Light and Light</td>
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</tr>
</tbody>
</table>
**Group 3: What A Load!**

*Materials: paper clip, wind up car, washers*

**Question:** What happens when the force stays the same, but the mass of an object increases?

**Hypothesis:** Predict what will happen to the distance the car goes as more washers/bolts are added to the load. Predict how many will make the car unable to move.

**Test it:**
Wind-up on the toy and let it go. Observe the distance traveled before the toy stops moving.

- Place four washers on the car, repeat. Compare how far the car went to last time.

- Place six washers on the car, repeat. Compare how far the car went to last time.

- Add four additional washers on each new run, until the toy can not move the weight. Compare the results of each run with previous runs.

**Conclusion:** Answer these questions as a group.
*Does increased mass/weight make it more difficult to move an object? Why?*

*If the force stays the same but the mass increases will an object slow down?*

**RECORD:**
As a group, you will be recording what your question, hypothesis, experiment and conclusion was. What did you learn? You can include what you’ve written on your worksheet as part of your video!
**Day 2:**

**Procedures:**

**LAUNCH:** 10 mins
(Make sure all students have completed the worksheets and notes, have students who are missing gather the worksheets they missed. Give students time to catch their group members up and to complete their notes).

Pose the question:
Look at your worksheets and notes from last week. What were some of the questions that we were talking about in our last lesson? Have students answer and discuss.
- What is mass?
- What is force?
- Do size and mass mean the same thing?
- What do you think mass has to do with force?

**EXPLORE:** 30 mins
Get with your group and use the iPad recording checklist to record a video. You can recreate one small part of your experiment in the video! We will get to share these videos with one another—and possibly with the whole class so make sure it is a good video. You are the teacher!! The other groups didn’t do the same experiment you did so we need to make sure they learn what you did!

*Set expectations!!
- *It has to stay at a good volume level; we couldn’t hear the audio in the videos we recorded last week*
- *Teamwork!! Each student needs to contribute*
- *Follow the checklist*

Students use the checklist and their worksheets/data to record an iPad video to share with the class.

**DISCUSS:** 5 mins
Make sure all students have completed the checklist and their video. Use the checklist as a “ticket out the door” for recess.
Be sure to tell students what you noticed during the lesson that you liked! (Good teamwork, noise level, handwriting, and ideas they had.)
iPad Recording Checklist
Directions: As a group, read the checklist and plan your video. Watch your video after recording and make sure it has everything from the checklist.

<table>
<thead>
<tr>
<th>Explain your experiment and the questions you are trying to find answers to.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Share</strong> two students hypothesis.</td>
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<tr>
<td>Show/ <strong>Demonstrate</strong> a part of what you did for your experiment.</td>
</tr>
<tr>
<td><strong>Explain</strong> if the hypothesis was correct or not. <strong>Explain</strong> your conclusion—what you learned.</td>
</tr>
<tr>
<td>Stay in <strong>one place</strong> while recording.</td>
</tr>
<tr>
<td>Make sure <strong>every person</strong> has a part or idea in the video.</td>
</tr>
<tr>
<td><strong>Re watch</strong> the video and make sure you can hear what each person said.</td>
</tr>
<tr>
<td><strong>Vote</strong> as a group to see if you think your video is your best work and should be published to the class.</td>
</tr>
<tr>
<td>Give your team a <strong>score</strong> from 1 (not great) to 5 (perfect) on how you think you worked together as a team!</td>
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Day 3
Procedures:
LAUNCH: 5 mins
Remind students that we are learning about MASS and FORCE and each experiment was testing what MASS and FORCE have to do with one another.
*Set expectations for video sharing

Explore: 20 mins
View each group video and discuss each - question/prediction/conclusion.

(Overall learning objectives from each video- make sure to discuss these key points)
Group 1: The heavier an object is, the more force you need to move it. The lighter object went farther. The heavy object didn’t go as far. The amount of force does change how far the objects moved. You need more force to move heavy objects than light ones.
Group 2: The heavier an object is, the more force it has. When a heavy object hits a lighter object it will keep going, the lighter object will change directions or stop. When objects of equal mass collide they will stop or both change direction.
Group 3: The force of the car remains the same. Additional weight is added to each run. At first, the amount of washers (weight) added does not affect the toy’s performance. Later on, each additional washer (increased weight) makes it more and more difficult to move the load. Finally, the load (weight/washers) cannot be moved by the amount of force applied. The more the mass, the more the force needed to move an object.

**What does it mean? Lets take some notes so we can remember what we learned today: answer the questions in their science journals

MASS AND FORCE NOTES
Mass: the amount of material in an object, affects how heavy something is.
Size:(how BIG an object is) does not mean the same thing as MASS, measured by weight.
The more MASS, the more force needed to move an object.
The more MASS an object has, the more force it has on other objects. An object with more MASS can cause an object with less mass to stop or change directions. Objects with equal mass will react the same when they collide.

**Accommodations:**
- Students who need more support will be put into groups to complete the learning objectives as a team. (Teacher created groups will allow me to pair high/low as well as avoid partnerships that would distract student’s focus)
- Students will add to their notes with guidance from the teacher so that they can refer to it later. (Check that B,V,D and S have completed these notes in their journals)

**Assessment:**
- I will assess students as they draw conclusions from their experiments to determine that they understand the learning objectives. I can check student’s conclusions on both their experiment worksheets and during their video presentations.
- Participation in group work and discussions will allow me to formatively assess that students understand the learning objectives.
- I will make it a requirement that all students participate and share ideas in the recorded video to check for their understanding. (Specifically look for feedback on B,V,D and S)

**Lesson 3: Review and Fluency Practice**
**Time:** 40 minutes
**Lesson plan:** (ideas)
http://www.k12reader.com/worksheet/push-and-pull/view/

**CORE Standards: 3rd Grade Science**
Standard 3
Students will understand the relationship between the force applied to an object and resulting motion of the object.

Language Arts
Reading: Informational Text Standard 1
Ask and answer questions to demonstrate understanding of a text,
Learning Objectives:
Students will demonstrate an understanding of the science topic (force and motion) by reading an informational passage and completing a summative quiz.
Students will work on fluency by partner reading
Students will work on reading skills and comprehension by highlighting key information from a text and answering text specific questions related to the science unit.

Materials:
Science notebooks
Fluency Passage Force and Motion
Force and Motion Quiz

Procedures:
LAUNCH: 10 mins
Pose the questions: (hint: look back in your science notebooks)
-What is force?
-What does rest mean?
-Give examples of push/pull from our chart/your life
-What does mass mean?
-How does mass affect force?
-How does an object change directions or stop?
-Does mass have anything to do with SIZE?
-Anything else someone wants to share?

EXPLORE: 20 mins
Today we will be combining fluency and science! *Review what fluency means (accuracy, rate, intonation) by having students discuss. Discuss how to be a good partner and practice fluency. Students are carefully paired (high/low) to read the passage and answer the questions as a team.
-Partner Read (working on fluency as a grade level goal for the week) each partner will read it once (so they will read the passage twice).
-Go back and look for important info in the article.
-Highlight important details (probably will be the things that are in bold text)
-Once students have highlighted important information they can turn the page over and complete the quiz.

Quiz: Answer questions on worksheet as a team.

DISCUSS: 10 mins
Correct the quiz responses together. Get a green pen to make corrections on your paper.
Did anyone find any information that was new?
What was your favorite part about science this week?
What is something you learned this week?
Talk about what we will be doing next week. (Extending what we know about force and motion to explore simple machines.)

Accommodations:
-Students who need more support will be paired with a strong reading partner. (High/Low partner B,V,D and S with a higher reading partner)
-Students will complete their quiz with their partner but each will have their own paper to submit.

Assessment:
-I will assess students as they highlight important information from the text to make sure they understand the main ideas.
-Participation in group work and discussions will allow me to formatively assess that students understand the learning objectives.
-I will collect each student’s worksheet as a summative assessment to show that students understood this topics learning objectives.
3. Focus Students:

Description of student 1: Danika

Danika is a student that receives daily intervention services for reading by attending a group called BURST with a resource teacher. In this small group intensive intervention time students relearn phonics and focused reading skills. She is also placed in the lower reading and math groups in the small group center instruction in the general 3rd/4th split class. Her DIBELS, iReady Math and SAGE test scores that were reported during PTC conference shows some growth for the year, but overall Danika is still well below proficient in every category. Danika always tries her best and does well at staying focused during tasks. This student craves positive feedback and more one on one attention than many other students. Her teacher told me that Danika is the baby of her family and is often treated that way at home.
Danika’s comes from a farming family who spends a lot of time travelling and taking care of cattle. Because of this profession and their whole family involvement, Danika misses a lot of school. I have also noticed that Danika frequently misses school because she “doesn’t feel good.” Most recently, this student missed an entire week because she had teeth coming in that were very painful. Danika’s mother is the room mom and very involved in school activities. During Parent Teacher Conference her mother was very open about Danika’s academic strengths and weaknesses however she does not see Danika’s frequent absences from school as a contributor to her academic problems.

I anticipated that this student would be frequently absent during the instructional time for this science topic. For that reason I was sure to keep the copy that I modeled of the guided notes so that Danika could have them when she returned to class. I also knew that she might have a hard time catching up if she missed the class experiments and so I planned a “review” time into each lesson where students could share what they learned from the previous lesson. During this time I could check that every student’s notes and worksheets were completed to make sure she had all the materials and resources that the other students had. I also carefully paired students into partnerships and groups so that Danika would always have a strong reading partner who was sure to be in attendance that might be able to fill her in on what she had missed. We will do another entire day of review before the summative assessment where I can check that Danika has the information on what she might have missed.

**Description of student 2: Buster**

Buster is a third grade student who has really benefited from being placed in a 3rd/4th split class and has often risen to the challenge of working at a higher level. A lot of the whole group instruction on reading skills, grammar, vocabulary and more is often geared toward the 4th grade level. Buster’s work has proven that he is an above average student. I knew that Buster would be a high student that I could pair with students who have lower reading skills so that he could offer them support. Buster’s DIBELS, iReady Math and SAGE test scores show that he is proficient in every category. This student always is contributing his ideas in class, and although he does not always have a lot of confidence in the way he answers questions he still tries and almost always
succeeds and contributes something very helpful in every lesson. Buster is a great leader in this class. He is quiet and has great manners, students watch and learn from his behavior. That is not to say that Buster doesn't occasionally need to be reprimanded. He has a close buddy in the class (a 4th grader) and sometimes they roughhouse and get off task. A quick reminder always refocuses Buster. I did not get the chance to meet with Buster’s parents during PTC, but I do know that he comes from a farming family. A lot of his time spent outside of school is working on the farm and taking care of animals. From what I have learned from Buster’s teacher, his parents do not place a lot of value in his academic achievements but do expect good manners and citizenship. Buster fulfills all of those expectations and more.

I knew that Buster would be a great contributor to partner and group work as well as in classroom discussions on science topics. I can always count on Buster during “review” time that is built into each lesson for him to catch other classmates up on what they have missed. He always provides the ideas and answers that I am looking for. Even when Buster isn’t confident that he knows the right answer, he will always try. During group and partner work Buster helps to keep his classmates on task.

4. Reflection:

Analysis of student learning:

Performance of Student 1 (Danika)

As I anticipated, Danika did miss a few of the science lessons in part one of our science unit. She was present at the first day of instruction and when her group performed the experiment on force and mass but she missed the video presentations and the final fluency and review lesson. During the first lesson I frequently had to pause and answer questions for Danika so that she could complete her guided notes. I modeled how to spell and what to write so that she would know what to do. At first Danika was sitting further away from me and so I asked students to move around so that she would be closer (without specifically requesting that Danika be the student to move next to me.) During the force and mass experiments I paired Danika with Group 1 “Flicking with Force” which included two other students who are very
strong readers and leaders. She did well with the group work and with the help of other students. For the summative assessment (given after an additional unit on simple machines) Danika missed the day of the test. On the make up test day she needed an aide to read the test to her and explain certain words. I also allowed each student 5 minutes at the end of the test taking time to check his or her work with his or her science journals. The summative assessment shows that Danika received the lowest grade on this unit with a score of 10 out of 18.

**Performance of Student 2 (Buster)**

Buster caught on quickly to the concepts in this unit. He was able to follow along and help other students in guided note taking and discussions. As usual, Buster added a lot of insightful and helpful information to our class discussions. I often asked Buster to explain his reasoning and thinking during sharing time and group work which benefitted both him and other students. In response to Buster’s groups experiment and video I realized that I needed to provide more structure within that activity. I knew that if Buster seemed confused about the expectations of the assignment then I must not have guided it well enough. This reflection led me to changing the length of the lesson as well as providing a checklist to guide the assignment. Buster was great to help the class review each day and remind us of what we had been learning about. The summative assessment shows that Buster received one of the highest grades on this unit with a score of 17 out of 18.

**Analysis of teaching effectiveness:**

One challenge that I had teaching during this entire Science unit was that I could not be in the traditional classroom setting for instruction time. Because this is a 3rd/4th split class, third grade science time has to be in the KIVA or library if no one is using it. The KIVA is a small space at the back of the school with stadium type seats. It is an area where students can play during indoor recess time and also an area that other classes frequently walk through to get to and from their classes. At the outset of the lessons I had to set behavior expectations specific to the KIVA. It was a challenge that I did not anticipate prior to beginning lesson plans for this unit. I had to have students gather close around me to watch the videos (and take notes with their guided notes) on my laptop. It was hard to hear but the students responded really well because of the proximity. I actually enjoyed all of us sitting closely in a tight circle— I had students move around me and made sure that the
students I needed to monitor were close.

In my first lesson I initially had wanted to do a “Walking Field Trip” to illustrate push and full forces. During this time students would walk around the school and look for force and motion and then we would share them together to make our class chart. Before the lesson started I realized that there might be a few challenges related to this activity. First, students were already a little unfocused because of the lesson taking place in the KIVA. I thought it we left the KIVA and walked around the school and playground it would be even more distracting. Second, I realized that there might not be a lot of things going on during that time for my students to observe. No one would be at recess or in the lunchroom and that might make this activity more challenging. Instead, I changed the lesson to a game of charades. I printed pictures of the motions we were studying on notecards and had students take turns acting them out. Then we discussed each motion and added it to a class chart we made together.

In response to formative assessments I also had to change the length of one of my lessons. When I planned the unit there were three lessons that I wanted to give in three days. Lesson two was where students were experimenting with force and mass in small groups. Students were then going to record their findings on the iPads and share with the class. At the end of day one I realized that students felt too rushed and were so focused on getting the iPad recordings done that they were not reflecting on what they had actually learned during their experiments. We also did not have time for closure, discussion and sharing on day one. After the first day I got a chance to view a few preliminary recordings that students had done. I had not set any rules or expectations for the iPad recordings and it showed. Students were moving all around, some groups had one student doing all the talking, other groups did not explain their experiment and one group had a video that was ten minutes long full of giggling and silly faces. I realized then that students had never had an opportunity to use the iPads in this way and that they needed more structure in this assignment. I wanted to use these videos as a way for students to show and teach concepts other students in the class as well as to show evidence of their understanding and learning for assessment purposes. In response to this I created a checklist for students to follow on Day 2 as they recorded their experiments and videos. After the second day I noticed a great improvement in the quality of videos and teamwork. We still did
not have enough time on the second day for closure, discussion and sharing and I knew that I wanted to solidify the concept and share with enough time for students to take notes on each video and give feedback to the presenting group. On the third day students got a chance to share their videos and really explain what they learned to the class. Students had enough time for note taking and discussion and really enjoyed sharing and “teaching” the class themselves.

Lesson 3 integrated fluency and science. Students in this class do not get a lot of time during Daily 5 for read aloud or partner reading. Fluency is an important skill and so we reviewed as a class what fluency means. Students were carefully paired into high/low partnerships for this lesson and would be allowed to work together to complete the assignment as a team (although my two lowest students were both absent that day.) The fluency passage was selected to review all the concepts covered so far of force, motion and mass. A short quiz at the end was used as a summative assessment before we would move onto simple machines.

**Assessments:**

The short assessment that was attached to the informational force, motion and mass passage was very simple and straightforward. Students had all of the information they needed to complete the quiz right in the passage. Students were very successful at completing this activity and I was confident moving forward to the next concept related to force and motion, which would be simple machines.

At the end of the unit students took another more comprehensive summative assessment combining both parts of the unit. After giving this assessment I realized that there were a few words that students did not understand—although I had used them when teaching the concepts. *Occur, react, friction, identify* were words that appeared on the test that many students asked me about. After reflecting on this, I realized that it wasn’t a bad thing to challenge my students by using those words. I knew that I had used those words when teaching the topics and the best way to learn new words and language is to be exposed to it! Maybe in the future I can be sure to emphasize those words and their meanings during the instructional time so students can recognize them more readily on the final assessment.
Overall Reflection:
I knew that I would need to be as flexible as possible while planning this 3rd Grade Science Unit because students from this class did not have a lot of exposure to science concepts and instruction yet this year. Many of the procedures and activities would be new for them and that could add extra time to explain and model procedures and expectations. I decided to pre-plan the unit three lessons at a time but then reflected on each lesson immediately after and made appropriate changes to the next one in response to student needs. This method resulted in a lot of beneficial changes for my students. I asked myself a series of questions and discussed them with my mentor teacher before making the necessary adjustments. Was there anything students seemed particularly confused about? What went well during that lesson? Do the students understand the learning objectives? Did I set appropriate behavior expectations and did students respond well/not well to them? Is the task or assessment well aligned with the standard? Are there any struggling students? How was the pacing/timing of that lesson? What do I need to do differently in the next lesson? This type of reflective questioning benefitted me (made me more effective) as well as my students. Overall I felt that Part 1 of this science topic was successful and was able to tie the first concept in with Part 2 (simple machines) very effectively.
Student Work:
Student 1 (Danika)

For Your Safety:
When something is at rest or sitting still, it stays sitting still unless acted on by an outside force.

In your own words: you would have to push it to get force.

Wishing gets you moved unless they get pushed or pulled.

An object at rest stays at rest unless acted upon by an outside force.

An object in motion stays in motion unless acted upon by an outside force.

**Force and Motion**

Motion is movement from one to another.

What makes something move?

Pushing, pulling, or hitting.

There are many ways (forces) you can use to get things to move. What are some ways you saw in the video?

Push, pull, brush, get dressed.

Push and Pull

Pushing moves things away from you.

What is one example of a pushing motion from the video?

Pulling moves things towards you.

What is one example of a pulling motion from the video?

Tell me a hammer.

Describe and write a few motions or actions from the video. Decide if it is a push, pull, or both.

Hug is a pull.
Group 1: Flicking with Force!

Materials: golf ball, ping pong ball, ruler and recording chart

Question: Does the amount of force change how far an object will move? Does the mass of an object have an effect on how far an object will move?

Hypothesis: Which ball will go farther: the golf ball or the ping pong ball and with how much force (soft or hard) and why?

Test it!: Complete the chart by flicking the ping pong ball and then the golf ball with a soft, and hard flick. Do one at a time and record how far the ball moved (in centimeters) on the chart.

Conclusions: Answer the questions as a group:

- Which ball produced the greater distance and why?
- Did the balls move farther when a greater or lesser force was applied to the balls?
- What does weight (mass) have to do with force?

Record:

As a group, record what your question, hypothesis, experiment and conclusion was. What did you learn? You can include your charts and what you’ve written on your worksheet as part of your video.
Force and Motion. Simple Machines Test

1. A ball is lying on the floor. When will the ball move?
   A. When a loud noise is made
   B. When an outside force acts on it
   C. When friction happens
   D. When friction happens
   X. What must be applied to push or pull an object?
   A. Gravity
   B. A force
   C. Direction
   D. Machines

2. A force occurs when a person or object moves from one place to another.
   A. Energy
   B. Pull
   C. Gravity
   D. Motion

3. What type of force is this person using?
   A. Pull
   B. Push
   C. Circular
   D. Slide

5. What type of force are these people using?
   A. Push
   B. Pull
   C. Motion
   D. Zig Zag

6. True or False? Circle one
   A. The mass of an object is how big or small it is.
   True False
   B. The bigger the object the less force it has.
   True False
   C. We use weight to measure mass.
   True False
   D. Objects with the same mass will react the same.
   True False
   E. An object at rest will stay at rest unless acted on by an outside force.
   True False

Identify the simple machine by its definition:

- Levers
- Compound Machines
- Pulleys
- Screw
- Inclined Plane

X. A stiff bar or rod that moves about a fixed point called a fulcrum.

9. A simple machine that is made from a grooved wheel with a rope or cable wrapped around it.

10. A machine that is made of a flat surface with one end raised higher than the other.
    Inclined Plane

11. A machine that is made of two or more simple machines.
    Compound Machine

12. A simple machine that is wide at one end and skinny or pointed at the other.
    Screw

13. A simple machine that has a wheel that turns around a stiff rod.
    Wheel and Axle

14. Give an example of a simple machine. Identify which simple machine it is.
    [Example answer: Inclined Plane]
**Mass and Force**

- Mass means how heavy or light something is. It does not matter.
- Objects that are light go farther.
- More force means more things.
- Heavier objects have more force.
- Mass is the same, they change directions and had same force.

More mass -> more force, less mass, less force.

**IMPORTANT**

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**Group 3: What a Load!**

**Material:** paper clip, wind-up car, washers

**Question:** What happens when the force stays the same, but the mass of an object increases?

**Hypothesis:** Predict what will happen to the distance the car goes as more washers are added to the load. Predict how many washers will make the car unable to move.

&larr; won’t go as far, I predict 5 &rarr; will make it stop.

**Test It:**
- Wind-up on the toy and let it go. Observe the distance traveled before the toy stops moving.
- Place four washers on the paper clip. Repeat. Compare how far the car went to last time.
- Place six washers on the paper clip. Repeat. Compare how far the car went to last time.
- Place six washers on the paper clip, repeat. Compare how far the car went to last time.

**Conclusion:** Answer these questions as a group.
- Does increased mass/weight make it more difficult to move an object? Why?
- If the force stays the same but the mass increases will an object slow down?
When something is at rest or sitting still, it stays sitting still unless acted on by an outside force.

In your own words:

- Something won't move until you move it.
- Nothing gets moved unless they get pushed or pulled.
- An object at rest stays at rest unless acted upon by an outside force.
- An object in motion tends to stay in motion unless acted upon by an outside force.

**Forces and Motion**

Motion is movement from one place to another.

What makes something move?

- Push, kick, pull, tug, hit.

There are many ways (forces) you can use to get things to move. What are some ways you saw in the video?

- Push and pull
- Brush teeth
- Pushing moves things away from you

What is one example of a pushing motion from the video?

- We push people on swing

What is one example of a pulling motion from the video?

- A horse pulls a wagon

In your own words, write a few motions or actions from recess! Decide if it is a push, pull or both.

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**Answer the following questions based on the reading passage. Don’t forget to go back to the passage whenever necessary to find or confirm your answers.**

1) When an object is at rest, how will it begin to move?

- by force

2) What are the two kinds of force called?

- push, pull

3) What is it called when a force makes an object move closer?

- pull

4) What is it called when a force makes an object move away?

- push

5) How does an object’s size make a difference in push or pull?

- by mass
1. A ball is lying on the floor. When will the ball move?
   A. When it leads someone to make it move
   B. When an outside force acts on it
   C. It will move more
   D. When friction happens

2. What must be applied to push or pull an object?
   A. Gravity
   B. A force
   C. Direction
   D. Machines

3. What occurs when a person or object moves from one place to another.
   A. Energy
   B. Pull
   C. Gravity
   D. Motion

4. What type of force is this person using?
   A. Pull
   B. Push
   C. Circular
   D. Slide

5. What type of force are these people using?
   A. Push
   B. Pull
   C. Motion
   D. Zig Zag

6. True or False? Circle one.
   - The mass of an object is how big or small it is.
   - The bigger the object the less force it has.
   - We use weight to measure mass.
   - Objects with the same mass will react the same.
   - An object at rest will stay at rest unless acted on by an outside force.

   Identify the simple machine by its definition:
   Wedge - Inclined Plane - Screw - Pulley - Lever - Compound Machine - Wheel and Axle

7. A stiff bar or rod that moves about a fixed point called a fulcrum.
   - Lever

8. A simple machine that is made from a grooved wheel with a rope or cable wrapped around it.
   - Pulley

9. A simple machine that is made of a flat surface with one end raised higher than the other.
   - Inclined Plane

10. A machine that is made or two or more simple machines.
    - Compound Machine

11. A simple machine that is wide at one end and skinny or pointed at the other.
    - Wedge

12. A simple machine that has a rod or cylinder with an inclined plane wrapped around it.
    - Screw

13. A simple machine that has a wheel that turns around a stiff rod.
    - Wheel and Axle

14. Give an example of a simple machine. Identify which simple machine it is.
    - Wedge - Pull - Pulley