

Lesson Plan Template

Grade: Kindergarten – 6 th Grade	Subject: Science
Materials: Basketball, dodgeball, whiffle ball, (etc. depending on number of groups). Large sticky note pad to write scores on Bowling pins (large purple bag in storage room)	Technology Needed:
Instructional Strategies: <ul style="list-style-type: none"> <input type="checkbox"/> Direct instruction <input type="checkbox"/> Guided practice <input type="checkbox"/> Socratic Seminar <input type="checkbox"/> Learning Centers <input type="checkbox"/> Lecture <input type="checkbox"/> Technology integration <input type="checkbox"/> Other (list) <ul style="list-style-type: none"> <input type="checkbox"/> Peer teaching/collaboration/cooperative learning <input type="checkbox"/> Visuals/Graphic organizers <input type="checkbox"/> PBL <input type="checkbox"/> Discussion/Debate <input type="checkbox"/> Modeling 	Guided Practices and Concrete Application: <ul style="list-style-type: none"> <input type="checkbox"/> Large group activity <input type="checkbox"/> Independent activity <input type="checkbox"/> Pairing/collaboration <input type="checkbox"/> Simulations/Scenarios <input type="checkbox"/> Other (list) <ul style="list-style-type: none"> <input type="checkbox"/> Hands-on <input type="checkbox"/> Technology integration <input type="checkbox"/> Imitation/Repeat/Mimic <p>Explain: Students will be split into groups of three and then we will come together for a discussion.</p>
Standard(s) 3-PS2-1 Plan and conduct an investigation to prove the effects of balanced and unbalanced forces on the motion of an object.	Differentiation Below Proficiency: Our kindergarteners will be grouped with some of the older students in order to let the older students guide them through the experiment. I will make sure to include the younger students by having them be the ones to pick out what ball they are going to use with their groups. I will also keep them involved by asking simpler questions that will require thought but they will still be able to answer. Above Proficiency: The older students will be tasked with guiding the younger students through this experiment. I will challenge them by asking them questions that require more thought. If they think the experiment is too easy, I will challenge them to knock the pins down from a further distance or with a lighter ball that will require them to throw with more force. Approaching/Emerging Proficiency: These students will also be expected to include the younger students in the experiment. I will ask them questions that prove their understanding of the experiment. Modalities/Learning Preferences: This lesson will be very visual for our learners as well as kinesthetic. They will be the ones who are knocking the pins down which allows them to see the force that is actually being applied in order for the pin to fall.
Objective(s) By the end of the lesson, students will have a better understanding of how force can be applied on an object by completing an experiment that requires them to determine the level of force they need to knock down bowling pins. Bloom's Taxonomy Cognitive Level: Understand, apply, analyze	
Classroom Management- (grouping(s), movement/transitions, etc.) <ul style="list-style-type: none"> • Clean Up <ul style="list-style-type: none"> - Everyone is responsible for clean-up. - Everything must be cleaned up. • Transitions <ul style="list-style-type: none"> - "One, two, three...eyes on me!" - "Three, two, one....my talking's done!" • Large Group Direct Instruction & Discussion <ul style="list-style-type: none"> - Active Listeners - Voice level 0 when others are talking. 	Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.) <ul style="list-style-type: none"> • Large Group Direct Instruction & Discussion <ul style="list-style-type: none"> ○ Students are expected to be active listeners. ○ Students are required to use voice level 0 during direct instruction. ○ Students are required to raise their hands with any questions. • Using Materials

Lesson Plan Template

<p>Teaching assistants will be participating with each group in order to ensure groups are staying on task and completing experiment expectations.</p>	<ul style="list-style-type: none"> ○ Students are required to share classroom materials and use them in a respectful manner. ○ Students are required to use the materials for their intended purposes only. ● Clean Up <ul style="list-style-type: none"> ○ Everyone is required to clean up their workspace. ○ Students are expected to put away material in the correct locations. ● Transitions <ul style="list-style-type: none"> ○ Students are required to use voice level 1 when transitioning from one activity to the next. ○ Students are expected to stop and listen when they hear the attention phrases.
Minutes	Procedures
<p>5</p>	<p>Set-up/Prep: (Complete set up during the first part of the hour while students are still working on their distance learning)</p> <p>Before setting up, I will need to determine how many groups I will have to figure out how many balls I need to grab from the storage room. I will also need to grab the bowling pins.</p> <p>Another important step is to determine where the pins will be placed in addition to where the students will be throwing/tossing/rolling from.</p> <p>Before the activity begins, I need to talk to my assistant teachers who will each be leading a group and make sure they understand the activity.</p>
<p>7</p>	<p>Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)</p> <ol style="list-style-type: none"> 1. Split the group into two even groups. Set up a starting point and a pin for each group, making one group’s starting point further away from their pin. 2. Have each group line up (single file) facing one pin. Give the team with the furthest starting point a smaller/lighter ball (whiffle ball). Give the team with the closer starting point a heavier larger ball (basketball or dodgeball). *I will instruct the students, not to be playing with the balls until they are given all directions* 3. Tell the groups that the first team that knocks down their pin is the winner. (Team with the heavier larger ball will knock their pin down first.) The students will not have started yet. 4. BEFORE STARTING, explain that the person who rolls the ball is the one who is in charge of getting the ball back to their team. They can run the ball back to their team, but they are not allowed to throw it to their team members. 5. Start the game <ol style="list-style-type: none"> a. If a group knocks their pin down quickly, have them do another round where they switch which balls each group is using giving the smaller ball to the group with a closer starting point and the larger ball to the group with the further starting point. 6. After the game is over, have the one student from each group collect their team’s ball and pin. 7. Gather everyone back in front of the big blue curtain for discussion.
<p>7</p>	<p>Explain: (concepts, procedures, vocabulary, etc.)</p> <ol style="list-style-type: none"> 1. Once the group is gathered in front of the curtain, discuss the results of the activity. The group who had the larger ball and closer target knocked their pin down first during the first round, and the groups had a more even result during the second round. <ol style="list-style-type: none"> a. Ask the group “Why do you think the group who had the closer target and basketball was able to knock their pin down faster?” Acceptable answers: “They had a larger ball and didn’t have to roll it as far to reach their target” “They didn’t have to roll their ball as fast to knock it down” *have the students raise their hands if they are answering the question, call on one student* b. If there was time for a second round, ask “Why do you think it was easier for this group once they had a heavier ball to knock over their pin?” Acceptable answers: “They had a larger ball to use and they were able to roll it with more force to knock the pin down” *have the students raise their hands if they are answering the questions, call on one student

Lesson Plan Template

	<p>c. Continue discussion to say, "Well why did the pin fall over when the ball hit it?" "Today we are going to explore why the ball was able to knock the pin over"</p> <p>2. "The ball was able to knock the pin over by applying a force onto it. A force can be a push *motion push* or a pull *motion pull*. Let's walk through some examples. *Show a picture of a bow and arrow* In order to shoot this arrow, what type of force will I need to apply?" Answer: "Pull". *Show a picture of a football being kicked* In order for me to kick this football, what type of force will I need to apply?" Answer: Push. "If I wanted to kick the ball really far, would I need to apply more force or less force?" Answer: "More force"</p> <p>3. Now we are going to do an activity to see how much force it takes to knock down six bowling pins. We are going to experiment to find out what kind of ball and how much force is needed to knock down as many of the pins as possible. We will split you into groups of three and then I need you to wait for your next instructions"</p>
13	<p>Explore: (independent, concrete practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)</p> <ol style="list-style-type: none"> 1. Once the group is split into equal amounts, explain the next steps. 2. "As a group, we are going to experiment with different types of balls and different amounts of force to find out which one works best to knock these pins down" 3. "Each group is going to get one ball to use. Your group is going to be able to practice and see how much force is needed to roll the ball to knock the pins over". "When your group decides on what ball to use, I want the youngest person in your group to come and grab the ball" 4. "Then, within your group, I want you to decide which member is going to be the one who rolls the ball at the pins" *The other teachers and I will walk around and help aid in discussion with the students* 5. "Each group gets their own pin to practice knocking down before we get together and try knocking all six pins down. We are going to be standing ____ feet away from the pins so try to practice from that distance" *A teaching assistant will be with each group to practice* 6. "You will get three minutes to practice knocking the pin down before we get together as a group and experiment" *give students three minutes to practice* 7. After the three minutes are up, gather the small groups back into one large group. "If you are the team member who is going to be knocking the pins down, I want you to line up here with your groups ball" "Make sure if you are holding the ball, that you are not playing with it and that you are watching the people in front of you" 8. "I want everyone else to sit ____ so that we can watch which ball and amount of force works best for knocking the pins down" *I will make sure that the teaching assistants are available to help me set the pins back up after each group* 9. Have sticky giant notepad available to write "Group one: type of ball, number of pins knocked down" etc. so that we can look back at the results after the experiment 10. *Let the first group test out their strategy, then second, then third, etc.* Reset pins after each attempt, write down how many pins were knocked over. <ol style="list-style-type: none"> a. If groups are not knocking down pins, let them try again but this time make sure they are throwing with more force or from a closer distance. -this will help in the discussion later on 11. After groups have tried their experiment, collect all balls and pins and have groups gather in front of the large curtain for group discussion
3	<p>Review (wrap up and transition to next activity):</p> <ol style="list-style-type: none"> 1. Discuss results of experiment with students. "Why do you think that group ____ was able to knock the most pins down?" Acceptable answers: "Group ____ had a heavier ball and they were able to apply more force to knock the pins down" 2. Ask "What type of force were we applying when we were knocking the pins over?" "Was it a push or a pull?" Answer: Push. "Yes, it was a push, because we were pushing the balls towards the pins to knock them over!" 3. Recap by asking what two forces the students learned about. "As we saw from our experiment, greater force needs to be applied if we have to throw a bigger object. If we get a big object to move fast, that means that it took a lot of force compared to the amount of force that we use on a small object". Close the activity by thanking students for their participation etc. Turn attention towards next lead student / professor in charge.
<p>Formative Assessment: (linked to objectives)</p> <p>Progress monitoring throughout lesson- clarifying questions, check-</p>	<p>Summative Assessment (linked back to objectives)</p> <p>End of lesson:</p>

Lesson Plan Template

in strategies, etc.

What kind of force are you putting on the ball in order to knock the pin down?

Would you need to be throwing with more force or less force in order to throw the ball and knock the pin down from a greater distance?

Consideration for Back-up Plan:

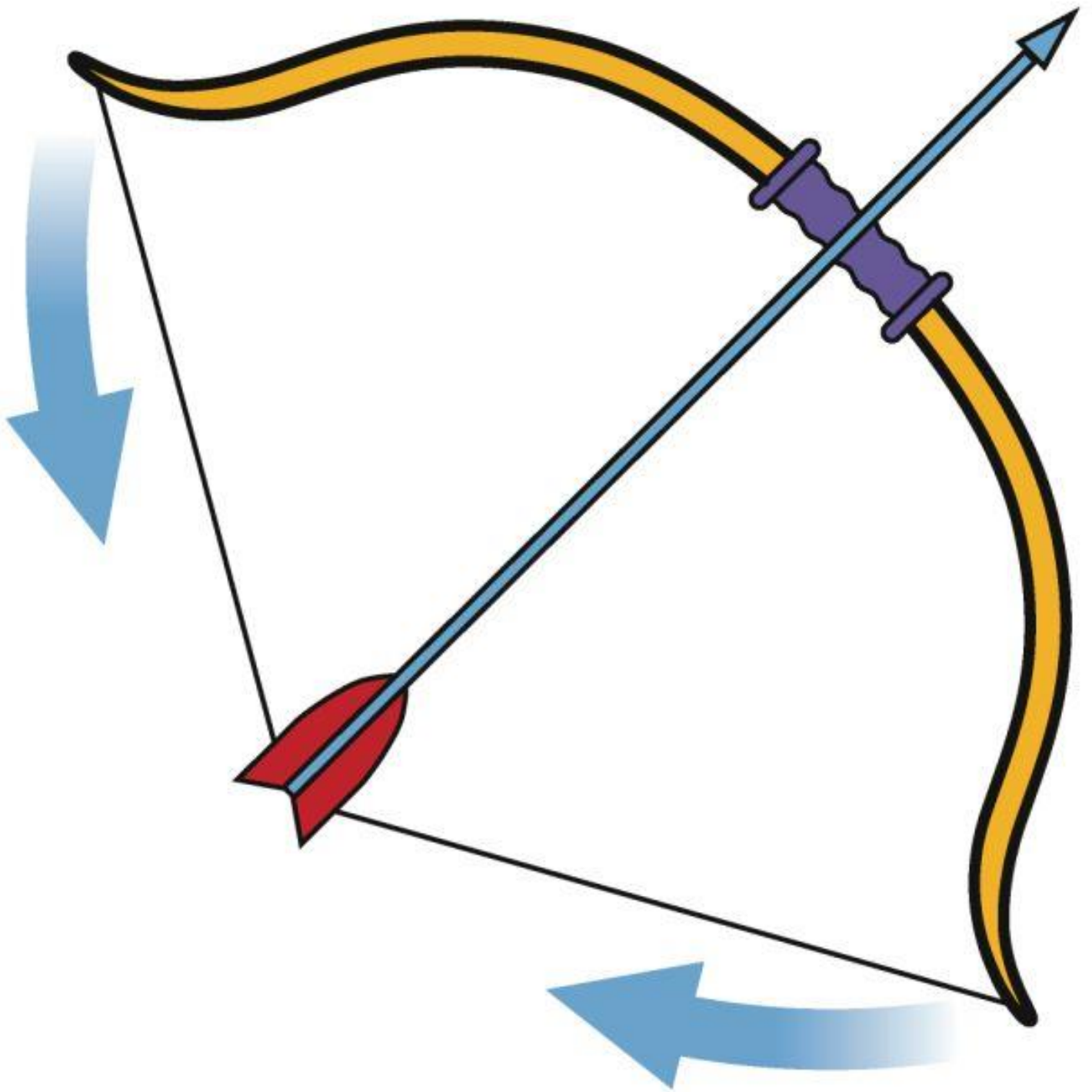
I could have each group determine on their own using all the different types of balls which ones would work best to knock the pins down and then bring the group together only at the end.

If applicable- overall unit, chapter, concept, etc.:

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

Before my lesson, I made a lot of changes once I gathered all my materials and saw the space that I had to work with. For this lesson, I completely eliminated the part of the experiment where groups would test multiple weights of balls. I realized that this idea was trying to incorporate too much into the lesson, and I was getting confused by it myself. I decided to have only volleyballs available for the students to use in their experiment. I also realized that the students may be able to learn more from personal experience instead of watching their classmates. For this reason, I made four "bowling alleys" and lined the students in their groups in their alleys. Then, after my first engagement activity I realized that the students were not very good at aiming. Because of this, I switched the lines I had originally planned on using to ones that are closer to the pins for the students to use. I also posted questions on the blue curtain behind us that the teaching assistants could use to further the students learning which I thought worked well. When we came back to the whole group at the end, the students were much more engaged and active in our discussion because they were confident in their answers. In order to help with time, I also had the teaching assistants reset pins. I also changed the engagement activity at the beginning of the lesson. I switch this activity to being more of a relay, just to get the students engaged. I gave both teams a volleyball and all members of the teams had to knock down the three pins before resetting them on their own. After they reset the pins, they were able to walk the ball back to their team members and sit in the line behind them so that we would know who was done first. The students also did a great job of cheering on their teammates which helped keep the excitement of the game high. Overall, I would say that the lesson went very well with my changes. They were able to learn about force by completing their own experiments to test force. They were also very excited about bowling.

Lesson Plan Template



Lesson Plan Template

