

TEAM Lesson Plan Template	
Teacher:	Kristen Early
Subject:	Math
Course Unit:	The Number System: Integers
Lesson Title:	Positive and Negative Numbers

LESSON OVERVIEW	
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In this lesson, students will actively engage in integrative, analytical, practical/relevant, and research-based thinking as they explore positive and negative numbers that represent quantities in real world contexts, explaining the meaning of 0 in each situation. Their goal is to be able to understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge).

Students will begin by engaging in a scavenger hunt game in which they must find an integer and silently line up with their classmates in the correct order to motivate and activate all learners. Next, the instructor will present the new material by introducing the topic, providing explicit vocabulary instruction, exhibiting visuals (videos and graphics) that extend and further explain the lesson's objectives, and providing high-order questioning and thinking opportunities. Students will then break off into small socially distant groups to sequence sentences based on their integer descriptions. The last activity will include students working in pairs to read short nonfiction, current, science news texts to extrapolate integers used in real world contexts and their meanings. At the end of class students will complete a formative assessment to be reviewed by the teacher who will then provide a grade and written feedback to their responses.

STANDARDS	
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Math - 6.NS.C.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real world contexts, explaining the meaning of 0 in each situation.

Integrated Standards:

Science

- 6.PS.1) Analyze the properties and compare sources of kinetic, elastic potential, gravitational potential, electric potential, chemical, and thermal energy.
- 6.LS.4) Using evidence from climate data, draw conclusions about the patterns of abiotic and biotic factors in different biomes, specifically the tundra, taiga, deciduous forest, desert, grasslands, rainforest, marine, and freshwater ecosystems.

- 6.LS.6) Explain how relationships between the movement and interactions of air masses, high and low pressure systems, and frontal boundaries result in weather conditions and severe storms.
- 6.ES.1) Gather evidence to justify that oceanic convection currents are caused by the sun's transfer of heat energy and differences in salt concentration leading to global water movement.
- 6.ES.3) Construct an explanation for how atmospheric flow, geographic features, and ocean currents affect the climate of a region through heat transfer.

Social Studies

- Identify and locate geographical features of ancient India, including: • Ganges River • Indus River • **Himalayan Mountains** • Monsoon winds • **Indian Ocean** • Subcontinent of India
- Identify and locate geographical features of ancient China, including: • Gobi Desert • Plateau of Tibet • **Himalayan Mountains** • Yangtze River • **Pacific Ocean** • Yellow River

ELA

- L.6.3 Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **SL.6.1 Engage effectively in a range of collaborative discussions [one on one, in groups, and teacher-led] with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.**
- 6.RI.RRTC.10 Read and comprehend a variety of literary nonfiction throughout the grades 6-8 text complexity band proficiently, with a gradual release of scaffolding at the high end as needed.

OBJECTIVE

1. The student will be able to **understand that positive and negative numbers are used together to describe quantities having opposite directions or values.**
2. **The student will be able to use positive and negative numbers to represent quantities in real world contexts, explaining the meaning of 0 in each situation.**

ALL students will be able to provide the opposite of a given integer with 100% accuracy.

ALL students will be able to use positive and negative numbers to represent quantities in real world contexts and explain the meaning of zero with 80% accuracy.

ASSESSMENT / EVALUATION	
	<p>Alignment with state content standards- Assessment plans are aligned to the standard because the student must demonstrate their understanding that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge) in order to sequence the sentences correctly in activity two. They will also be assessed on this portion of the state standard on the formative assessment at the conclusion of the lesson. For the last activity, the students must use positive and negative numbers to represent quantities in real world contexts, explaining the meaning of 0 in each situation as they read through the articles and then write their responses.</p> <p>Clear Measurement Criteria- The students will be assessed in the hook activity based on whether or not the numbers are accurately in order as they would appear on a number line. For the sequencing activity, the students will be assessed based on if the integers represented in the sentences are accurately in order based on a number line. For the article activity, the students will be assessed based on their ability to determine what is being measured in the text, what the meaning of positive versus negative is for each context, and what the meaning of zero is for each context. Lastly, the formative assessment will be measured based on the student's ability to provide correct integers given various scenarios and opposites. The assessments are all inherently objective; therefore, they naturally lend themselves to clear measurement criteria.</p> <p>Measure student work in more than three ways-</p> <ol style="list-style-type: none">1. Lining up with peers in correct sequential order2. The H.O.T. questions the students will answer in their math journals during instruction3. The sequencing activity4. The article with written responses5. The formative assessment at the end of class <p>Extended written tasks- Students will write their responses to the H.O.T. probes during instructional time. Then they will have another writing opportunity during their article reviews. The article reviews are a more extensive written task because the students must analyze and evaluate the text then support their claims with text evidence.</p> <p>Portfolio-Based- Students keep an interactive math notebook that provides the instructor with clear examples and entries that indicate student progress toward mastery of state standards. Currently, notebooks include notes and activities from lessons on fractions, decimals, and GCF/LCM. We are extending our knowledge base of the number system to include negative numbers in this introductory lesson.</p> <p>How Assessment Results will be Used to Inform Future Instruction- Student data will shape how the instructor will form partners and groups for future whole group lessons along with the formation of remediation and extension groups. Formative quizzes help not only the teacher plan for summative testing, but also the quizzes help students know their progress standard by standard so they have a clear focus of what</p>

they need to study in order to prepare for benchmark testing. Benchmarks exams guide planning for TnReady testing reviews.

MATERIALS

- Number/Integer Cards taped to the walls for lining up activity
- Lesson Nearpod
- Scenario Sentence Cards for the Sequencing Activity
- Articles
 - https://newsela.com/read/mt-everest-shrinking/id/2000000907?preview_for=assignment
 - https://newsela.com/read/ocean-noise/id/15513?preview_for=assignment
 - https://newsela.com/read/natgeo-extreme-habitats-around-globe/id/2000002420?preview_for=assignment
 - https://newsela.com/read/seals-high-tech-hats/id/2000003256?preview_for=assignment
 - https://newsela.com/read/lib-experiment-storms-balloons/id/37027?preview_for=assignment
 - https://newsela.com/read/loc-mysteries-static-electricity/id/25218?preview_for=assignment
 - <https://www.allstate.com/blog/plan-ahead-know-how-to-jump-start-a-car/>
 - https://www.treasurydirect.gov/govt/reports/pd/histdebt/histdebt_histo5.htm
- Guiding questions while reading the articles
- Student Math Journals
- Copies of the formative assessment

ACTIVATING STRATEGY

Motivator / Hook
 An Essential Question encourages students to put forth more effort when faced with complex, open-ended, challenging, meaningful and authentic questions.

Essential Question: How are positive and negative numbers used to represent quantities in real world contexts?

Supporting Questions:

Activating Strategy: Students will move and play the lining up game as an initial challenge.

Teach Like a Pirate Hooks:

- The Contest Hook- *Can you line up correctly without talking or touching according to the numbers you find?*
- The Real-World Application Hook- Analyzing and evaluating current texts detailing happenings in Science in order to make the connection of why understanding integers is relevant and practical.
- The Kinesthetic Hook- Students are moving throughout lesson activities. Students are physically manipulating numbers and their bodies rather than writing and ordering them on paper alone.

INSTRUCTION / STUDENT WORK	
1. Hook a. Find a number and line up silently and accordingly	
2. Teach a. Nearpod	
3. Activity One a. In this activity, students must organize, interpret, analyze, synthesize, and evaluate information rather than reproduce it. b. Sequence the scenarios in small groups c. Example: credit of \$6, debt of \$10, owe \$15, given \$25 (Organize the cards, interpret the integer, analyze and synthesize the order, evaluate for accuracy)	
4. Activity Two a. In this activity, students must draw conclusions from scientific articles, make generalizations about the integers within, and produce arguments that are supported through extended writing regarding what is being measured and the representations of zero, negative, and positive measures. b. The students are connecting what they are learning to experiences, observations, feelings, and situations significant in their daily lives both inside and outside of school because of the topics represented in the articles. c. Articles with discussion i. What is being measured? ii. How could the measurements be positive or negative? What is the positive? What is the negative? iii. What would zero represent? (neutral)	
5. Close a. Quiz (formative assessment)	

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2. Teach
 - a. Nearpod

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 - b. The students are connecting what they are learning to experiences, observations, feelings, and situations significant in their daily lives both inside and outside of school because of the topics represented in the articles.
 - c. Articles with discussion
 - i. What is being measured?
 - ii. How could the measurements be positive or negative? What is the positive? What is the negative?
 - iii. What would zero represent? (neutral)

5. Close
 - a. Quiz (formative assessment)

Instructional Plans:	
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Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real world contexts, explaining the meaning of 0 in each situation.

Sequenced from basic to complex- The simplest part of the standard is the idea that there are negative and positive numbers and that each number has an opposite and an absolute value (distance from zero). This builds the foundation of student understanding before moving onto the real world context component. Students will explore this concept as they line up for the lesson hook and activating strategy. They will gain further explicit instruction regarding the vocabulary and identification and labeling of such numbers during the whole group instruction.

After this the students will be required to describe and represent quantities as well as sequence them appropriately. This activity is slightly more challenging because students must organize the cards, interpret the sentence to extrapolate an integer, analyze and synthesize the order, evaluate for accuracy. Finally, the most complex part of the standard and lesson requires students to understand the standard as a whole and use positive and negative numbers to represent quantities in real world contexts, explaining the meaning of 0 in each situation. Which is why for the final activity the students must draw conclusions from scientific articles, make generalizations about the integers within, and produce arguments that are supported through extended writing regarding what is being measured and the representations of zero, negative, and positive measures.

Build on student prior knowledge- Students have prior knowledge of fractions, decimals, LCM, and GCF. We are building on their prior knowledge of the number system through the introduction of negative integers.

Integrate other disciplines-- (see *Standards* above) This mathematics lesson integrates ELA, Science, and Social Studies standards.

Relevant to student lives- This lesson is relevant to students' lives because the articles they will be analyzing are all current Science articles describing current events. Also, students have been specially placed in their pairings for their assigned articles based on their interest. For example: one student wishes to be a mechanic when he gets older and his assigned article is on the negative and positive charges within a car battery. Another student is deeply interested in politics and economics and will be analyzing the national debt trends over the last decade.

Regular opportunities to accommodate individual student needs-- In the activating game, all students will participate and be working together to try to accomplish a goal. Students will be given opportunities to work together in groups and to discuss their answers. The lesson incorporates lots of movement which is extremely beneficial for students who have an attention deficit disorder. For students who struggle to write, the lesson provides ample discussion time to lead students into forming their thoughts and opinions before being asked to write responses.

