

Musical Chairs with Words and a Ball

Resource ID#: 130863

Primary Type: Lesson Plan

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This lesson introduces students to concepts and skills that they will use throughout the year. Students will learn that the terms point and line are considered "undefined." Students will play musical chairs while learning to develop precise definitions of circle, angle, parallel line, and perpendicular line, using counterexamples at different classroom stations. Students will identify models, use notation, and make sketches of these terms.

Subject(s): Mathematics

Grade Level(s): 9, 10

Intended Audience: Educators

Suggested Technology: Document Camera, Computer for Presenter, Interactive Whiteboard, Computer Media Player

Instructional Time: 40 Minute(s)

Keywords: point, line, definitions, example, counterexample, geometry, , parallel line, perpendicular line, angle, circle, vocabulary, word structure

Instructional Component Type(s): Lesson Plan

Resource Collection: FCR-STEMLearn Geometry

ATTACHMENTS

[Musical Chairs Lesson Presentation.pptx](#)

[Musical Chairs SA KEY.docx](#)

[Word Decoding Start with the Beginning in Mind extension handout.docx](#)

[Handout 1 Definition WordBallCircle.docx](#)

[RUBRIC DefinitionWordBallCircle.docx](#)

[Formative Assessment Checklist.docx](#)

[Handout 2 Geometric Terms.docx](#)

[Musical Chairs SA.docx](#)

LESSON CONTENT

- **Lesson Plan Template:** General Lesson Plan
- **Formative Assessment**

The teacher will walk around the classroom during the guided practice activities to ensure students are able to apply the concepts being taught. The teacher will gauge the students' understanding through answers to questions posed to the class, through listening to the discussions the students are having in their groups, and through participating in group discussions as he/she walks around the classroom.

1. Prior to starting the Musical Chairs portion of the lesson, the teacher will ask students to identify physical representations of the words prior to having the students define them.
2. The teacher will walk the classroom and observe students work during the musical chairs activity. The teacher will ensure students are writing precise definitions and valid counter examples during this activity.
3. The teacher will ensure the students write complete, grammatically correct sentences, are having meaningful discussions, and are expressing their thoughts on paper during the end of the opening activities where students are creating precise definitions of "word," "ball," and "circle."

For more guidance, also see the Formative Assessment Guide and the Rubric Definition WordBallCircle attachments.

- **Feedback to Students**

Students will receive feedback from the teacher during all of the activities. The teacher will inform students by asking guiding questions, by modeling behaviors, by providing correct answers provided by the teacher and other students when verified by the teacher. The teacher will assess each student as he/she examines the work from Musical Chairs.

- **Summative Assessment**

The summative assessment will be the attached worksheet, Musical Chairs Summative Assessment. The assessment is aligned with the objectives.

- Questions 1-3 are aligned with objectives 1 and 2.
- Questions 4-6 are aligned with objective 1.
- Questions 7-9 are aligned with objective 3.
- Questions 9-11 are aligned with objective 4.

- **Learning Objectives: What should students know and be able to do as a result of this lesson?**

Students will be able to:

0. Define and use a counterexample.
 1. Distinguish between a precise definition of a geometric and a definition that is not precise by identifying counterexamples or the lack thereof.
 2. Write precise definitions of (define) angle, circle, parallel line, perpendicular line, and line segment in terms of the undefined notions of point, line, distance.
 3. Describe the concept of the undefined terms point and line.
- **Guiding Questions: What are the guiding questions for this lesson?**
 - What is a definition?
 - How are definitions created?
 - How do you know if a definition is correct?
 - Do we need definitions in geometry? If yes, then why?
 - Do definitions change over time?
 - Are definitions the same everywhere in the world?
 - **Prior Knowledge: What prior knowledge should students have for this lesson?**

Students must be able to identify geometric shapes.

No prerequisite standards identified for congruence in MAFS.

- **Teaching Phase: How will the teacher present the concept or skill to students?**

Open the "Musical Chairs Lesson Presentation." As students are entering, the teacher will give each student Handout 1 Definition WordBallCircle.

Slide 1

- The teacher will start the slide show. Touch the screen once to reveal the first guiding question.
- The teacher will ask the students to think about the question and then write down their thoughts after discussing it with their group. Each student will write their own thoughts on the paper.
- Once the students have settled in and have had a chance to write answers, the teacher will solicit answers from students and post them in the classroom. (Remember, there is no right or wrong answer – guide the students to make sure they have written clear and concise thoughts). Do not discuss answers at this time, just post them.

Slide 2

- Ask students: "What is a word?" (avoid using the word "definition")
- Ask students to answer the question on the paper they were given. The teacher will walk the classroom to ensure students are writing clear, concise, and grammatically correct sentences.
- After students have had some time to answer, the teacher will ask someone from each group to write the answer on the board (or a flipchart). Do not discuss answers at this time.

Slide 3

- Ask the question again – "What is a definition?" Solicit answers again or have students read what they previously wrote. Add any new ideas. Then, reveal the next question (Why do we have definitions?) and ask the students to think about the answer. Call on a couple of students to share. Discuss their answers.
- Do not correct answers at this time; leave the discussion open-ended.

Slide 4

- The teacher will ask students "What is a ball?" and then "Write your thoughts on your paper."
- The teacher will solicit answers from the students.
- As students are answering the question, the teacher will help them refine their definitions by writing counterexamples on the board.
- If available, some balls could be used as a visual aid.
- See the rubric for sample student definitions and the teacher's counterexamples.
 - *Do not introduce them to the term "counterexample" yet.*
- Summarize the class' definition of a "ball."

Slide 5

- Sample balls

Slide 6

- Ask the first two questions rhetorically. Allow for any new ideas.
- The teacher will reveal the 3rd and 4th questions and discuss with the class the process of using counterexamples to test a definition.
- The teacher will develop a definition of counterexample based on the process that was just used on the previous slide.

- The teacher will reveal and facilitate discussion of the 4th question (leave open but ensure that students understand that definitions have to be accepted by the users within a language – this will start introducing students to the structure of a language).

Slide 7

- The teacher will ask students to examine the words on the list.
- The teacher will ask the students what do these words have in common and then the teacher will introduce structure of the word (prefix, suffix, root word).
- The teacher will ask students what does counter mean?
- The teacher will ask students what does counterexamples mean and how does it apply when writing definitions.
- *Return to the slide with "word" (slide 2) and create a precise definition, using counterexamples to the definitions written earlier.*

Slide 8

- The teacher will share definition from Webster so that students can see how they were successful in creating a definition. This will also inform them for how to be precise in writing a definition going forward for unknown geometric terms.

Slide 9

- The teacher will discuss these examples of how words have structure within and how words have structure which can help students define unknown geometric terms. For example, you can use the structure of a common word like bicycle help define bisect and other words with the same root.

Slide 10

- The teacher will refine the earlier definitions of word using counterexamples.
- The teacher will call on students to provide counterexamples to refine the definition.
- If students are having trouble creating counter examples, then the teacher will provide feedback to correct them (formative assessment).

Slide 11

- The teacher will share definition from Webster so that students can see how they were successful in creating a definition. This will also inform them for how to be precise in writing a definition going forward for unknown geometric terms.

Slide 12

- If time permits, this is a good example of how there are different representations of words other than the grouping of letters. This is analogous to notation and sketches in geometry.
- The teacher will ask the students to try to decipher this message from Roger Federer.
- The teacher will ask the students "Do these symbols represent words?" and then "Do you know of any symbols that are used to represent words in math? in geometry?"
 - Some possible answers: add, subtract, multiply, divide, equals
- Next, before going to the next slide, distribute the second handout Geometric Terms to each group.
- The teacher will ask the class to identify an example of a point, line, parallel line, perpendicular line, circle, and an angle in the classroom.
- The teacher will ensure students are able to correctly identify models of these words in the classroom (formative assessment).

Slide 13

- The teacher will introduce this slide by asking students to identify models of the words that will be defined – circle, point, line, line segment, angle, perpendicular line, and parallel line.
- The teacher will work with the class to create a precise definition of a circle using counterexamples.
- The teacher will solicit a definition of circle from a student.
- The teacher will call on students to provide counterexamples to refine the definition.
- If students are having trouble creating counterexamples, then the teacher will provide feedback to correct them (formative assessment). The teacher will summarize by sharing a precise definition of circle. (This concludes the teaching phase.)
- At the end of this slide, the teacher will pass out one set of Handout 2 Geometric Terms to each group.

- **Guided Practice: What activities or exercises will the students complete with teacher guidance?**

For guided practice, the students will play "musical chairs." During this activity, students will be asked to identify models of a point, line, circle, perpendicular line, and parallel line in the classroom. The class should have already been grouped into teams of 6 students and have the one of the pages from Handout 2 Geometric Terms.

Students will define one of the 6 words. Then they will travel around the classroom creating counterexamples for others' definitions. Finally, the teacher will consolidate the results of the students' efforts so they have a complete list of precise definitions.

The teacher will also travel the classroom during this activity (see "Formative Assessment Guide" handout).

Continue the slide presentation.

Slide 14

- The teacher will explain the instructions as they appear on the slide.
- Prior to starting this activity, the teacher should have made copy sets of Handout 2 Geometric Terms. The handout contains 6 pages – one for each word. It has a place for students to write a definition and space for 4 counter examples. (1 for each time the students move and one extra). Each student should have a sheet with a word from Handout 2 Geometric Terms.

Slide 15-20

- The teacher will use these slides to write students' results (using white board) or to display it when writing on a flip chart. The teacher will note that students are having difficulty defining point and line without using the words line or point. The teacher will explain the notion that these are the undefined terms.

Slide 21-22

- The teacher will bring closure to the lesson with these slides.
- The teacher will use responses from students to complete the chart.
- Emphasize students should treat geometric terms as a new language.
- Ask students to complete the table together
- Assist students where necessary so that the table is completed accurately
- The teacher will use this slide to *introduce* notation for the words that were defined (remember emojis from slide 12). An extension could be more work using notation.

- **Independent Practice: What activities or exercises will students complete to reinforce the concepts and skills developed in the lesson?**

The students will complete the summative assessment for independent practice. See the "Musical Chairs Summative Assessment" handout. Allow students 10 minutes to complete the handout. Pass the assessment out after completing the last slide (22) of the guided practice.

- **Closure: How will the teacher assist students in organizing the knowledge gained in the lesson?**

Wrap up the lesson by reviewing each precise definition that was created by the class. Align the definitions with other representations of the words such as their notation and sketches. There is a slide in the presentation that gives an example of a definition list and it includes the term, a precise definition, and other representations of the word (a sketch and notation).

ACCOMMODATIONS & RECOMMENDATIONS

- **Accommodations:**
 - A definitions and key words list in Spanish and Creole (or the native language of the English language learners (ELL) in the class.
 - Ensure any ELL students are paired with bilingual students who speak the ELL student's language.
 - If students are identified as having disabilities or special needs, then the teacher will accommodate the students based on their plans and their needs.

One general option is to allow SWD and ESE students to write their counterexamples on a sheet of paper they will carry with them during musical chairs. They will be allowed to write 2-3 counter examples while moving from table to table instead of 5 counterexamples. This will allow them more time. This can also be used for students that have limited mobility.

- **Extensions:**
 - Have students look up the etymology of point, line, circle, parallel, and perpendicular.
 - Have students complete the handout, "Word Decoding: Start with the beginning in mind."

- **Suggested Technology:** Document Camera, Computer for Presenter, Interactive Whiteboard, Computer Media Player
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Special Materials Needed:

Make a class set of the following handouts (1 per student):

1. Musical Chairs Summative Assessment Handout
2. Handout 1 Definition WordBallCircle
3. Slide #21 from the PowerPoint presentation

Make four sets of Handout 2 Geometric Terms (one for each group of six students).

Music is needed for Musical Chairs during the Guided Practice.

It is also recommended that several copies of the extension handout (Word Decoding: Start with the Beginning in Mind handout) be made.

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Further Recommendations:

This lesson includes an activity where students will leave their seats and walk around the classroom several times while music is playing. Prior to starting the lesson the teacher will need to arrange the classroom so that there are at least four groups of 6 students. If there are more students, then the teacher should divide the number of students by 6. This will give the number of groups in the classroom. Ensure the desk have enough space around them to allow students to move freely.

This lesson is a good introduction to the use of a word wall in the classroom and the use of a vocabulary log which includes the word, a precise definition, a sketch and the proper notation.

Additional Information/Instructions

By Author/Submitter

Applicable Math Practices:

- MAFS.K12.MP.6 Attend to precision.
- MAFS.K12.MP.7 Look for and make use of structure.
- MAFS.K12.MP.3 Construct viable arguments and critique the reasoning of others.

SOURCE AND ACCESS INFORMATION

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Related Standards

Name	Description
LAFS.910.RST.2.4:	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
MAFS.912.G-CO.1.1:	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.