BSU Elementary & Early Childhood Education Department
Science Lesson Plan Template
created May 2018
Modified from MA DESE Model Curriculum Unit Lesson Plan Template
http://www.doe.mass.edu/candi/model/default.html
http://www.doe.mass.edu/candi/model/MCUtemplate.pdf

Day 3- Explain

Teacher Name(s): Tessa Pequita and Ashley Leonard

Lesson Duration: *(date and time) 30 min*

Standard(s) to be addressed in this lesson: (*For science, include the number and write out the full performance expectation.)*

Science Standard- 3-PS2-3. Conduct an investigation to determine the nature of the forces between two magnets based on their orientations and distance relative to each other.

Math Standard-Measurement and Data

K.MD.B.3 Classify objects and count the number of objects in each category.

3. Classify objects into given categories; count the numbers of objects in each category (up to and including 10) and sort the categories by count.

Unit Goal and Science/Engineering Practice: *(For science, write the "Students will learn that…" goals being addressed and the associated science and engineering practices used to teach each.)*

1. Students will learn that…. Magnetics have a force that changes depending on orientation.
2. Students will learn that… Magnets have two different poles.
3. Students will learn that… Magnets will repulse from one another based on poles and distance.

Which Essential Question(s) does this lesson help to address?

(For science, state your how/what/which/where inquiry question that guides this lesson.)

1. How does a magnet's force change depending on its orientation?
2. What are the names of a magnet's two poles?
3. What causes a magnet to repulse or attract?

Learning Outcomes: *(For example, "Given [materials], students will be able to [specific task] [measurable criteria]." This should be about your formative assessment at the end of the explain and*

-Given an assortment of materials, the students should be able to predict which items are magnetic and which objects are not.
-Given a worksheet, students should be able to explain what materials are magnetic and what materials are not.
-Students should be able to define repel and attract.
-Students should know the two different poles on a magnet (North and South)
-Students should know that opposite poles attract each other
-Students should know that the same poles repel each other

Assessments: *(include all that are relevant for this lesson; formal and informal)*

Pre-Assessment: *Happens in the engage to probe students' ideas; e.g. predictions, brainstorming, graphic organizers, etc. You will not have a learning outcome for this.*	**Formative Assessment**: *What is the task students will do <u>at the end</u> of the explain and elaborate to show you they learned the science content and/or can accomplish the practice(s) in the standard? This should be a product you can collect as evidence of students' mastery of the learning outcome. This is what the learning outcome is about.*	**Summative Assessment**: *This will only be at the end of your unit. It should expect students to show their learning for the whole unit. You will write a learning outcome for this too.*
-Read students the anchor chart.Reviewing magnetic concepts; poles, attract, repel, force, magnetic. - Have a class discussion and have the students fill in the blank spaces on the anchor chart.	-Have students complete an activity and chart comparing and contrasting magnetic and non-magnetic objects. - The students will complete an 8 question scavenger hunt. This scavenger hunt will include math questions as well as questions about magnetism. -Using what we learned we will have an end-of-class discussion about what objects were and were not magnetic.	This assessment will be at the end of the unit. This post assessment will be in paper form. The students will answer the questions that we asked on the preassessment and they will answer a few more difficult questions as an adjustment to practice.

Differentiation:

Accommodations *(from 504 Plans/IEPs)*	**Modifications for English Learners**
N/A	N/A

Targeted Academic Language:

Teacher Content Knowledge: *Detailed science information to help you teach this lesson. Include additional relevant terms with grade-level appropriate definitions that may come up during the lesson but that you are not planning on explicitly teaching.*	**Lesson Vocabulary with Grade-Level Appropriate Definitions:** *Only include those words you are explicitly teaching during this lesson, or that you taught in a previous lesson and students are using and practicing again.*
Magnetism-A magnet's ability to attract certain materials **Magnetic Field-** The Space around the magnet where the force of a magnet can act **Electromagnets-** Special magnets created by electricity.	*Force- The power to push or pull something* *Attract-to pull toward* *Pole- The point on a magnet where the magnetic force is strongest* *Repel- To push away*
Scientist: *What type of scientist studies this topic? What does this type of scientist do?*	
A physicist studies magnetism. A physicist studies the relationship between matter and energy	

What should students know and be able to do prior to starting this lesson?

Student Background Knowledge: *List the funds of knowledge students may have for this concept. Be sure these ideas are described above in Teacher Content Knowledge. Also, take a look at your assessment data.*

Alternative Understandings: **-**Originally the students knew that magnets are the things that we stick on the fridge. They now know that this is true but there are also magnets in other places.	**Accurate Conception:** -The preassessment taught us that students understand that magnets stick to metal. -Students generally understand the meaning of repel and attract.
Based on the placement of your lesson in your unit, what should students come to your lesson already knowing? **-Prior to starting the lesson students should know that magnets stick to metal** **-Students should know that magnets have two poles.** **-Students should know that magnets have a North and a South pole.** **-Students should know that opposite magnet poles attract, and the same poles repel.** **-Students know that magnets are useful in many of the electronics that we use.**	**Based on formative assessment data from your previous lesson (or pre-assessment data if this lesson is first), what gaps in student knowledge can you identify?** -The students do not know anything about electromagnets. We may mention this briefly but it is not in the standard. -Students are not completely confident with the knowledge of which sides of the magnets repel and attract. -Students need to be reminded of the meaning of vocabulary words.

Instructional Items: *(explain in detail; attach extra items and pictures of charts or other tools used to the end of your lesson plan)*

Materials for Students and Teacher	**Resources** *(such as texts, videos, websites, etc.)*	**Tools** *(such as anchor charts, scientific or mathematical equipment, etc.)*
● Worksheets for object sorting ● Writing Utensils ● Anchor Chart/Sticky Notes ● Magnets	● Magnets Push, Magnets Pull Book	● Anchor Chart ● Magnets ●

• Materials to try and stick to magnets (Paperclips, highlighter, Book, Side of the desk, Tissue box, pen) • Paper clips and magnets for "Making a Magnet Activity"		

Lesson Delivery

This is specific to the content area you are teaching, including an explanation of:

- *Differentiation Strategies (highlight these in your steps below)*
- *Safe Learning Environment (include examples in your steps below)*
- *Step-by-Step Procedures (be specific below)*

Engage: *How will you get students excited? How will you find out what they know about the current lesson? How will you review from previous lessons?*
- I will get the students excited by telling the students that we are going to be working with magnets today and that we are going to start with an anchor chart activity. I will also tell them that we will be doing a scientific investigation, and then finally we will be making our own magnets out of paper clips. - I will gauge what they learned from previous lessons by asking the students to fill in the blanks on the anchor chart that I created. This anchor chart includes the definition of the words: repel, attract, force, poles, and magnet. The chart discusses which parts of the magnets attract and repel. It also discusses the difference between the magnets poles. - This anchor chart will also be a review all of our previous lessons. I will also remind the students of the book that we read on magnets, and explain that we will be using the book a little bit more during this lesson. - **Differentiation**- If I find out through this preassessment that students are still having a difficult time with the definitions of certain vocabulary words. I will show the students a visual representation of the word. I will then have the students model what I show them back to me.
Essential/Inquiry Question: *What is your how/what/which/where inquiry question to guide this lesson? Include the steps for how you will communicate this to your students. Include scaffolds for making predictions, if relevant.*

Essential Question: How do poles and distance affect attraction/repulsion?
I will write this on the board. I will communicate this question to students by breaking it into multiple parts to scaffold.
- I first ask how poles create repulsion.
-Then I will ask how poles create attraction.
- I will then ask how students think distance can affect the force of a magnet.
-I will ask them if holding metal close to a magnet would have the same reaction if the same metal was held far away.
(I will demonstrate with physical magnets.)

During the Lesson:

Explore: *Write step-by-step directions for you and your students to conduct the exploration. Include rules/safety reminders, transitions, grouping, material distribution, and how you will model what students will do.*

SLE- Before starting the lesson I will ask the students to tell me how they are feeling today. I will have the students show me a thumbs up if they are feeling good, to the side if okay, and down if bad. This will help inform my practice.

After discussing the anchor chart and the inquiry question, we will move on to the hands-on portion of the lesson.

Transition: Alright everyone, now we will be completing a magnet activity. I will be passing out magnets and papers. Make sure you have your pencils ready and you write your name on the top of your paper when you get it.

-I will pass out a magnet to each of the students

- I will pass out a worksheet with 8 questions related to magnets which will help guide the students on a magnet scavenger hunt.
- Everyone listen up. Clap in rhythm to get the students attention. Explain that I will be telling them the instructions.
- I will read the instructions to the students. I will explain that the students first have to try to stick their magnets to the highlighted object. Then I will explain that when they finish that they must circle the words that explain the object they tested.
- I will tell the students that they have almost everything they need at their desks but when they go to the whiteboard they must go quietly and to take turns testing the materials. They must also keep their hands to themselves.
- I will give the students 10 minutes to complete the activity and then when they are done they will complete the math section of the worksheet.

- The math worksheet asks the students to organize the objects into groups and then count how many members are in each group.
- Students will first count which objects were metal. We will discuss this as a class.
- Then they will count how many objects were not metal
- Then they will count which objects were too heavy for the magnet and which objects were light for the magnet.

Explain: *Include a detailed student and teacher explain, with scaffolds to help your learners develop a claim, evidence, and reasoning. Include the anticipated claim, evidence, and reasoning for the inquiry question. Connect your explanation to the explore and to other resources (books, videos, etc.).*

How do poles and distance affect attraction/repulsion?

Now that we conducted this experiment we know that many things affect the force of magnets

-Magnets have a much stronger force when metal is close. Metals attract to magnets easier when they are closer.

-Magnets also can only pick up objects that are lighter than them most of the time.

-Magnets can not attract things that are very far away. Strong magnets can attract metal further away than weaker magnets.

-I will explain that we saw this in our experiment today. We saw that our magnets stuck to metal objects. We saw that magnets had better attraction when they were closer to the metal and to each other.

-I will explain that we also learned this in the book.

-I will remind them that the book explained this and how the book also explained that magnets can work through glass, water, and paper.

Elaborate: *This may include an inquiry question, investigation, and/or CER framework, or be another type of creative project or real-world situation. An elaborate is usually an entire lesson in itself, and after the Lesson Opening above should be explained entirely here.*

For the final activity of this lesson, we are going to make our own magnets as the children did in the book that we read.

-Hand out paper clips

-Once everyone has a magnet explain that to the students that they will drag the magnet from one end of the paperclip to the other end 30 times. Then we will test the paper clips on the white board.

The students will have a worksheet to complete an activity. This activity will

Math Portion- Sorting objects? Which objects can we pick up with a magnet?

Standard:Math Standard-Measurement and Data
K.MD.B.3

- **Classify objects and count the number of objects in each category. 3. Classify objects into given categories; count the numbers of objects in each category (up to and including 10) and sort the categories by count.**

Students will participate in a magnet scavenger hunt.

- This scavenger hunt will include 8 objects (White board, Paperclips, Side of Desk, Paper, Highlighter, Eraser, Slide, School Bus)
- The students will test the magnet on each of these objects (Except for the school bus and the slide)
- The students will determine if the objects are made of metal or not.
- The students will determine if the objects are near or far from the magnet.
- The students will determine if the objects are light or heavy.

The students will make groups out of these six categories. They will sort the objects into the metal category, non-metal category, near category, far category, light category and heavy category.

- The students will count how many objects are in each category based on the sorting.
- Discuss the categories and number of object in the categories. Compare objects sorted.
- Were there more magnetic objects or non-magnetic objects in our categories?

Lesson Closing: *(When and how will students do your end-of-lesson formative assessment? After this is finished, how will you conceptually wrap-up the lesson? Link this to your standard and goal. Preview for the next lesson, if relevant.)*

At the end of the lesson, we will have a classroom discussion on what we did that day. We will review the scavenger hunt as a class and discuss it. I will ask students questions based on the lesson and have them show thumbs up if they agree and thumbs down if they do not agree.
- Magnets can pick up objects without touching them. (Yes)
-Magnets can pick up objects if they are not too heavy. (Yes)
-Some magnets have a stronger force than others (Yes)

-I will finally explain that tomorrow we will have our last science lesson. Ms. Leonard will make sure that we are all magnet experts and we will get to use the magnets in science one last time.

List of Lesson and Content Knowledge Resources: *(use APA citation style)*

Adler, D. A., & Raff, A. (2017). *Magnets push, magnets pull*. Holiday House.