Field Version of UMF Unit-Wide Lesson Plan Template

Name: Rachel Yorke	**Program:** Secondary Ed	**Course:** 460
Lesson Topic/Title: Introduction to Scatter Plots		
Lesson Date: 3/36/17	**Lesson Length:** 2 days	**Grade/Age:** 8th grade

Learning Objectives (Targets):
Students will be able to construct scatter plots from quantitative data.

Students will recognize if scatter plots have a correlation and whether or not that correlation is positive or negative.

Students will be able to predict and interpret correlations between two quantitative variables.

Content Standards:	**Content Standards Alignment & Justification:**
Investigate patterns of association in bivariate data. CCSS.MATH.CONTENT.8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	Students will first be shown what a scatter plot is and how it is constructed, then they will contribute to creating a scatter plot with their classmates, comparing shoe size and height. It will be a relevant and interactive way for students to see the creation of a scatter plot. Students will then be engaged in a discussion on the relationship present in the scatter plot and how to interpret correlation.
Assessment: ☐ Pre ☒ Formative: Students will be writing in their math journals and will explain the types of correlation and give examples of each type. Students will also complete a worksheet on correlation and construction of scatter plots. I will also be checking for understanding during the direct instruction by gauging the responses to my questions. ☐ Summative ☐ Student Self	**Assessment (Data & Student Feedback):** I will use the math journal entries to check for understanding and respond to the students with feedback. I will be checking for correct definitions of each type of correlation, and I will be checking for correct examples. The students will also be doing a worksheet that covers all of the objectives. I will use the worksheet to determine if students are ready to move onto line of best fit and it will count as participation points for them.

Integration of Other Content Areas: (If appropriate)

English: Students will create and write in their math journals to wrap up the lesson. They will be asked to summarize what they have learned by defining the three types of correlation and giving one example of each. It is used as an opportunity to reflect on the lesson and practice their writing skills. Writing in math also helps students improve problem solving skills and solidify their understandings.

Instructional Strategies to Differentiate Whole Class Instruction:

This lesson begins with direct, whole group instruction as it is a completely new topic for all of the students. Many of the students prefer to be shown the material before working directly with it, which is why this is a good lesson to use direct instruction. On the second day of the lesson, students have the option to work independently or in small groups on the worksheet. The shoe activity also gives students the chance to get up, move around, and experience a change in scenery. The shoe decorating caters to the artistic students and the entire lesson works well for visual learners as the will be able to directly see relationships between variables in a scatter plot.

Modifications / Accommodations / Extensions For Individual Students with Identified Needs:

Modifications: No modifications necessary. Since this is new material for all of the students, it will be taught at a pace and a level that will be well understood by students, thus not requiring the lowering of standards.

Accommodations: There are a few students in each class who have ADHD. They sometimes have difficulty focusing and following directions. In the B group, students C, D, and B often need subtle reminders to stay on task. I typically will walk up to their desk and just tap it and that usually works. In the C group, students A and C also tend to get off track very easily. To accommodate these students, I will be explicit, yet simple and structured in my delivery of the content. The lesson also includes a hands-on activity to vary the pace of the instruction which should help in keeping students' attention. Also in the B group, D has a hearing impairment. D has been moved to the front of the room so they can hear my instructions and follow the lesson easier. In the A group, student E has Tourette Syndrome. This student's biggest difficulty is with writing and completing tasks within the given time frame. To accommodate this, time frames for all of the tasks are flexible. If students do not complete something in class, they are allowed to complete the tasks later at their own pace. Students also have assigned seats to prevent anticipated behaviors and to easily refocus students who have difficulty with staying on task.

Extensions: For students who quickly understand correlation, we can have a discussion on causality and possible confounding factors between two variables.

Technology Integration: (if appropriate)

Students will all be invited to edit a document on their laptops in which they will enter their height and shoe size. The students will then examine the table to determine if there is a relationship between the variables.

Materials and Resources for Lesson Plan Development

White board
Projector
Notes
Shoe drawings
Masking tape
Student laptops
Scatter plot worksheet

http://sstadler.blogspot.com/2014/10/end-of-quarter-check-in.html

Teaching & Learning Sequence:
Day 1 (53 minutes):
Explain objectives and agenda (3 minutes)
Box plot review (3 minutes)
Have students cut out shoes and enter data in Google Doc (5 minutes)
* Ask students if they notice anything about the data
* Explain that relationships can sometimes be seen better withs scatter plots
Introduce scatter plots (3 minutes)
Shoe activity (15 minutes)
* Have students tape shoes in appropriate spot on graph
*Have students share what they notice about the graph
* Ask what happens to shoe size as height increases
* Explain that it represents a positive correlation
* Ask students questions requiring interpolation and extrapolation
Have students return to seats and continue with slideshow (15 minutes)
Journal entry (10 minutes)

Day 2 (30 minutes):
Review over previous days' content (5 minutes)
Have students work in groups on scatter plot and correlation worksheet (25 minutes)

Content Knowledge Notes: *(if applicable/instructor discretion)*

Scatter plots: Show the relationship between two sets of quantitative data as ordered pairs
Interpolation: Finding a value inside of our data points
Extrapolation: Finding a value outside of our data points
Positive correlation: As one set of values increases, the other tends to increase
Negative correlation: As one set of values increases, the other tends to decrease
No correlation: The values show no relationship
Strong correlation: The values are close together and form an almost linear pattern
Weak correlation: The values are not as close together

Common Core Teacher Standards (CCTS) Alignment & Justification *(Field/Student Teaching Only)*

Standard #2 Learning Differences: *The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that allow each learner to reach his/her full potential.*

This standard means that I must have a deep understanding of not only where my students come from and their values, but also of the community in its entirety as a means for developing lessons that reach all students and make them feel included.

Description: The lesson has been adapted to use a method for creating scatter plots that relates to their previous understandings of graphing ordered pairs, building on previous understandings. Additionally, the examples in the lesson have been created with students' interests in mind and students also have the opportunity to share their own examples.

Performance 2(c) :

Designs instruction to build on learners' prior knowledge and experiences, allowing learners to accelerate as they demonstrate their understandings.

Rationale: Students will turn data into ordered pairs before creating the scatter plots, building on previous knowledge. In addition, by incorporating examples that relate to students' interests, they are more inclined to understand the material and participate in the lesson.

Standard #4 Content Knowledge: *The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners.*

In order for me to effectively reach my students and create meaningful lessons, I must have a deep understanding of the content and patterns within the content. Building lessons that are representative of the nature of the discipline are critical in developing students' mentalities toward it. In addition, by having a deep understanding of my discipline, I am able to offer appropriate extensions, modifications, and accommodations that still target the objectives.

Description: Students will be engaged in questions that, when given two variables, allow them to determine what type of correlation those variables will have.

Performance 4(c):

Engages students in applying methods of inquiry and standards of evidence used in the discipline.

Rationale: I will model a method of inquiry in which students are guided to determining correlation. Students will first identify the two variables, they will then determine if one of those variables increases what the other variable is doing in order to determine the correlation.

Post-Lesson Reflection:

This lesson went exceptionally well. All of the students were engaged throughout and they all seemed to have a good understanding of how to construct a scatter plot and how to interpret correlation. They were responsive to my questions and were great participants in the activity. Many of the students enjoyed designing their shoes and they all turned out really well. I think that by comparing height with shoe size, the students were able to get a good understanding of how correlation works. They were all able to interpolate and extrapolate values by observing the trend.

For this lesson, the one thing I would change is when I ask students for examples. I frequently ask students to think of examples in class and, typically, the same students respond. Next time I implement the lesson, I will do a Think, Pair, Share in which students think of their own examples of positive, negative, or no correlation and then pair up with a partner to discuss. By doing this, students will feel more apt to share their ideas as it will feel like less of a risk to them.

After reviewing their journal entries, it is clear that most of the students have a good idea of what correlation is. We will review the inquiry process for predicting correlations next class, but the students seem ready to move onto line of best fit. Since the next lesson and this lesson are directly related, students will be continually applying the skills they learned in this lesson.