Polynomial Jeopardy

I. Content:
Students are going to participate in a Jeopardy game to be the last day of review before the final assessment for this unit. They will work together in groups and answer all of the questions from the Jeopardy game. Their answers will need to be unanimous and they will all be able to present the answer when called upon. Students will all work together to have the team succeed and win the most points through the final jeopardy question.

Ms. M’s Jeopardy Rules:

- Every student must write down his or her work for each and every problem to get credit.
- The group must present one answer and Ms. M has the decision of who is presenting the answer.
- If a team presents an incorrect answer, the first person to raise their hand that Ms. M sees will be allowed to steal the points if they answer correctly.
- The winning team will receive five points, the second place team will receive candy and the rest of the teams will receive knowledge.
- Ms. M will have the final say on any and all questions – there will be no discussion after the final say.

II. Learning Goal(s):
Students will know and be able to:

- Factor basic trinomials
- Multiply binomials
- Gain confidence in multiplying and factoring skills
- Focus not only when it is their turn, but other groups’ turns as well
- Correct their own answers based on the correct answers given by the group
- Recall and review past information through the jeopardy game

III. Rationale:
This entire class really enjoys playing Jeopardy. I want to encourage their learning and their working hard through the “boring” days (like the tiered worksheets we did the lesson before). We will be practicing skills from this unit in addition to reviewing some information from past units (direct and inverse, function notation, scientific notation, exponential and exponent rules). I also want to make sure that every student is participating in the game and not just on their team’s turn or just floating by and letting their other teammates do all the work. Having them show all their work on paper and being able to call on anyone at any time is a way for me to know all of the students are getting something out of the class today.

IV. Assessment:
Students will be graded for today on their own papers and how much work they are doing in class. If I see all (or almost all of the problems) attempted, they will receive full credit for the day. In addition, there will be a short exit slip in which students can ask any final questions they need clarification on before the test the following day.

V. Personalization:
Students are in completely heterogeneous groups. Explaining their work, and how to do the work, to their entire group, will challenge those who need to be challenged. They will not be the ones I choose to present the answer, so they need to make sure another group member conveys their answers. The students who need support will have their group members talking them through the problem and how they did it so they are able to answer the question.
VI. **Activity description and agenda:**
Grouping: Students will be in heterogeneous of 3 or 4 that are pre-assigned
Materials: Game board, questions on index cards, answer key, white lined paper

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<thead>
<tr>
<th>Time</th>
<th>What Students Do</th>
<th>What Teacher Does</th>
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<tbody>
<tr>
<td>0-6</td>
<td>Students will enter the room and sit in their assigned groups. They will begin working on the POD that is on the board.</td>
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<tr>
<td>6-10</td>
<td>Students will each have a piece of white lined paper and something to write with. They will be listening as I explain the rules and asking questions as needed.</td>
<td>Jeopardy game set up. I will explain the rules. I will read the categories.</td>
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<td>Work with their groups to answer all of the questions in the jeopardy game. Make sure the team agrees on an answer or a &quot;steal.&quot; Participate in the Jeopardy game.</td>
<td>Play Alex Trebek and conduct the Jeopardy game. Ask students questions based on their choice and designate points to the appropriate team once the team has reached a unanimous decision.</td>
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<td>All students will work with their groups to answer the final jeopardy question. They will all show work and understand how they got their answers. They will then get their work checked and points tallied.</td>
<td>Final Jeopardy question is asked trying to incorporate everything they have learned this unit and they will all have the opportunity gaining points for the team. Everyone needs to have the same answer AND work shown for the team to get those points. I will collect work after spot checking and tallying points.</td>
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<tr>
<td>55-60</td>
<td>Students will complete an exit slip in their POD books before leaving class.</td>
<td>If you could ask me any questions before your test tomorrow, what would they be?</td>
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VII. List the Massachusetts Learning Standards this lesson addresses.

A.SSE.1A - Interpret expressions that represent a quantity in terms of its context. Interpret parts of an expression, such as terms, factors, and coefficients.

A.SSE.2 - Use the structure of an expression to identify ways to rewrite it. *For example, see* \(x^4 - y^4\) *as* \((x^2)^2 - (y^2)^2\), *thus recognizing it as a difference of squares that can be factored as* \((x^2 - y^2)(x^2 + y^2)\).

A.SSE.3 - Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

A.SSE.3A - Factor a quadratic expression to reveal the zeros of the function it defines.

A.APR.1 - Perform arithmetic operations on polynomials. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
A.REI.4B - Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers $a$ and $b$.

F.IF.8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

F.IF.8A. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

In addition, frameworks that are addressed by the “review” categories

VIII. Resources:
Jefferson LAP – Alex Wohler

IX. Reflection

As I said previously, I added in an extra day for factoring practice. However, because of scheduling and timing, I still wanted their test to be on Friday. I had already moved the test from Thursday to Friday to accommodate more practice. I couldn’t stretch things out until Monday. Therefore, this Jeopardy game got moved until the Friday before vacation. I decided that out of everything, this gave students the least amount of practice. I considered keeping it in before the test because it would hold students accountable for practicing (I had a few students during the practice days that were wasting time). However, I knew that the students would benefit more from individual practice and the puzzles held their attention quite well. I think it all worked out for the best.

This Jeopardy game also worked as a great “before vacation” activity. It touched upon concepts we’ve covered all year and kind of brought everything together. It especially works well because immediately following April vacation, I am only here for one week and that’s it. I start linear functions for them and then Shannon takes over. This was kind of my wrap up to my teaching in a way. We’re talking about everything I’ve taught them this year here.

In terms of how the game went I was very impressed. I added another category involving GCF and Solving Quadratics for zeros (which is what we went into after we did the concept map wrap up). There was plenty to work with and I was so happy with how much the students remembered. Of course, they were not the most difficult questions in the world because it was material we had covered a while ago but the fact that they can still remember and apply the rules is awesome. In addition, they all thought the Quadratic Vocab section was incredibly easy. I explained that we had covered that stuff most recently so it makes sense that it came easiest, hence the value of review. That is an awesome lesson for them to have picked up on.

I would say that students were fairly engaged throughout the course of the game. I had trouble in 9A with one group that gave up towards the end but I pulled them back in. Then in 9B something similar happened where the group said they were giving up but they really just wanted to make a big deal out of it and did not actually do so. In 9B I was incredibly proud of Steven. His behavior was a little on the line at times but he was certainly on that day. He got a lot of questions for his group and was very excited and proud of himself. Of course, this lead to jumping up and screaming in excitement which was not completely necessary but it was nice to see him excited about something. He has this idea in his head that he’s “stupid” and that everyone thinks that of him but he proved to himself and everyone else that day that he is just as smart and capable. Something I knew a long time ago, it just took him some time to come around.

Going forward, I need to keep in mind it is all about teams. Good teams for this is key. Most of my teams worked out the way I planned. However, there were some groups where one student was sitting back and letting their teams do the
work. They will not get classwork credit for the day if they were not doing the work themselves but that is an extrinsic consequence. I need to make them WANT to do the work and WANT to play on their own. For the most part they all were but there were times I looked up and certain students were not engaged. Then again, it was the last Friday before vacation at the end of the day and we were playing a game. It went a lot better than I expected. I also always forget how they thrive on competition but also how it effects them both in a good and bad way. Some of them are sore losers which is hard. I think competition helps motivate them in a good way but that added component of losing is difficult to deal with at times like this.