Math 9 - Vacation to OUTER SPACE

You are going on a vacation to the “*Planet of the Exponents*”. When you get there, the citizens of *Exponents* are up in arms because of all the silly tourists who keep breaking the laws of the land. They commission you to make a tourist brochure laying out all the laws of the planet. **Your assignment is to**:

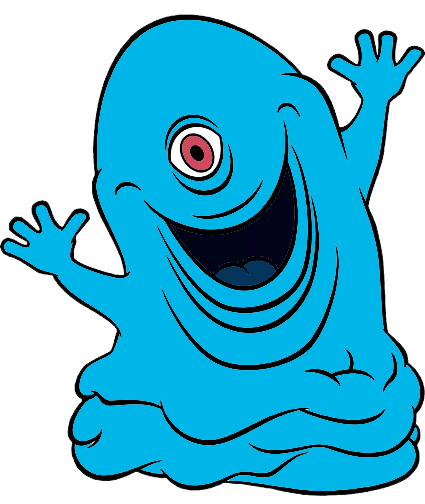
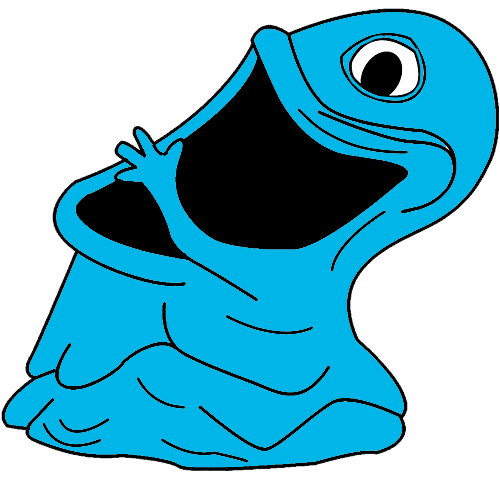
1. Explain the rules of Exponents
2. Come up with consequences if tourists break the rules (***be creative but remember math law don’t equate to capital punishment!***)
3. AND to show (pictures/descriptions) the ways in which tourists have commonly broken the rules (*see below for rules*) so that future tourists know not to do it again.

**You must explain the following laws in your brochures**: *All Rules should be in your OWN words!*

1. The product rule
2. The quotient rule
3. The power rule
4. The rule for “zero” exponents
5. The rule(s) for negative exponents

**You must include the following in your brochures**:

1. Real life examples (at least 2!) where exponential growth and decay occurs. Include explanations!
2. Real life examples (at least 3!) of where scientific notation for both positive and negative exponents is used. Include why scientific notation is useful!
3. An explanation of how to complete mathematical operations (BEDMAS) with numbers scientific notation.
4. Be as creative as you wish. You must include pictures and descriptions of the planet, as well as make sure to include all items on the list above.
5. You may do this brochure on paper or you may do it electronically using Microsoft publisher or another brochure program. If you do it on paper, make sure that your handwriting is neat and legible, that the brochure is well organized, and that there aren’t a lot of smudges, crumples or erasures. ***These brochures will be posted in our classroom!***
6. The rubric you will be graded with is on the next page.



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| **Criterion C: Communicating** | | | | | | |
| **(0)** | **Beginning (1-2)** | **Developing (3-4)** | | **Accomplished (5-6)** | **Exemplary (7-8)** | |
| *I have not achieved a standard described by any of the descriptors to the right*. | *I am able to:*  **use** limited mathematical language  **use** limited forms of mathematical representation to present information  **communicate** through lines of reasoning that are difficult to interpret.  You did not include anything in your brochure but a straightforward explanation of the rules  Explanations are unclear or examples aren’t provided. It is not easy to tell from your brochure how to avoid common mistakes. | *I am able to:*  **use** some appropriate mathematical language  **use** appropriate forms of mathematical representation to present information adequately  **communicate** through lines of reasoning that are complete  adequately **organize** information using a logical structure.  You have some consequences for breaking the rules but they are uninteresting and you have no creative touches.  A few easy ways to make mistakes with the rules are presented, but specific examples aren’t present or are not well explained. | | *I am able to:*  usually **use** appropriate mathematical language  usually **use** appropriate forms of mathematical representation to present information correctly  usually move between different forms of mathematical representation  **communicate** through lines of reasoning that are complete and coherent  **present** work that is usually organized using a logical structure.  You have some consequences for breaking the rules and you have one or two extra creative flairs (pictures or descriptions of the planet.  There are some clear examples of each rule used incorrectly along with an explanation about why the answer is incorrect | *I am able to:*  consistently **use** appropriate mathematical language  **use** appropriate forms of mathematical representation to consistently present information correctly  move effectively between different forms of mathematical representation  **communicate** through lines of reasoning that are complete, coherent and concise  **present** work that is consistently organized using a logical structure.  You’ve thought of funny, interesting consequences for breaking the rules, you explain the planet or the aliens a little, you provide pictures or other creative elements.  There are clear examples of each rule used incorrectly along with an explanation about why the answer is incorrect | |
| **Criterion D: Applying Mathematics in Real-Life Contexts** | | | | | | |
| **(0)** | **Beginning (1-2)** | | **Developing (3-4)** | **Accomplished (5-6)** | | **Exemplary (7-8)** |
| *I have not achieved a standard described by any of the descriptors to the right*. | *I am able to:*  **identify** some of the elements of the authentic real-life situation  **apply** mathematical strategies to find a solution to the authentic real-life situation, with limited success.  The rules may be written and or named but they are not explained well and examples are not provided | | *I am able to:*  **identify** the relevant elements of the authentic real-life situation  **select**, with some success, adequate mathematical strategies to model the authentic real-life situation  **apply** mathematical strategies to reach a solution to the authentic real-life situation  **discuss** whether the solution makes sense in the context of the authentic real-life situation.  The rules are presented and are named, but explanation is lacking and examples may be missing | *I am able to:*  **identify** the relevant elements of the authentic real-life situation  **select** adequate mathematical strategies to model the authentic real-life situation  **apply** the selected mathematical strategies to reach a valid solution to the authentic real-life situation  **explain** the degree of accuracy of the solution  **explain** whether the solution makes sense in the context of the authentic real-life situation.  Most of the rules are neatly presented, named and “proved” (show why each rule works) and examples of using the rule are presented. | | *I am able to:*  **identify** the relevant elements of the authentic real-life situation  **select** appropriate mathematical strategies to model the authentic real-life situation  **apply** the selected mathematical strategies to reach a correct solution to the authentic real-life situation  **justify** the degree of accuracy of the solution  **justify** whether the solution makes sense in the context of the authentic real-life situation.  The rules are neatly presented, named and “proved” (show why each rule works) and examples of using the rule are presented. |