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 or 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. 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.
4. 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!***
5. The rubric you will be graded with is on the next page.



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| **Criterion A: Consequences for breaking rules** |
| **(0)** | **Beginning (1)** | **Developing (2)** | **Competent (3)** | **Mastery (4)** |
| *I have not achieved a standard described by any of the descriptors to the right*. | You did not include anything in your brochure but a straightforward explanation of the rules | You have some consequences for breaking the rules but they are uninteresting and you have no creative touches. | You have some consequences for breaking the rules and you have one or two extra creative flairs (pictures or descriptions of the planet. | You have 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. |
| **Criterion B: Explanation of common mistakes** |
| **(0)** | **Beginning (1-2)** | **Developing (3-4)** | **Competent (5-6)** | **Mastery (7-8)** |
| *I have not achieved a standard described by any of the descriptors to the right* | Explanations are unclear or examples aren’t provided. It is not easy to tell from your brochure how to avoid common mistakes. | A few easy ways to make mistakes with the rules are presented, but specific examples aren’t present or are not well explained. | There are some clear examples of each rule used incorrectly along with an explanation about why the answer is incorrect | There are clear examples of each rule used incorrectly along with an explanation about why the answer is incorrect |
| **Criterion C: Explanation of Exponent Laws** |
| **(0)** | **Beginning (1-4)** | **Developing (5-8)** | **Competent (9-12)** | **Mastery (13-16)** |
| *I have not achieved a standard described by any of the descriptors to the right*. | The rules may be written and or named but they are not explained well and examples are not provided. Some rules may be missing or are incorrect. Laws may be copied directly from the notes | The rules are presented and are named, but explanation is lacking and examples may be missing. All laws are included and correct. Some laws are written in your own words | Most of the rules are neatly presented, named and “proved” (show why each rule works) and examples of using the rule are presented. Most laws are written on your own words | The rules are neatly presented, named and “proved” (show why each rule works) and examples of using the rule are presented. All laws are presented in your own words. |
| **Criterion D: Real life examples of exponential decay or growth** |
| **(0)** | **Beginning (1)** | **Developing (2)** | **Competent (3)** | **Mastery (4)** |
| *I have not achieved a standard described by any of the descriptors to the right*. | Poor attempt to explain how exponential growth or decay works in a real life situation | Mathematical strategies used may not completely model the situation or are only partially correct. Steps may be missing | Correctly demonstrate exponential decay or growth. | Correctly demonstrate exponential decay **AND** growth. |
| **Criterion E: Real life examples of scientific notation** |
| **(0)** | **Beginning (1-2)** | **Developing (3-4)** | **Competent (5-6)** | **Mastery (7-8)** |
| *I have not achieved a standard described by any of the descriptors to the right*. | At least one example of a real-life situation where scientific notation could be used in provided.Examples of how to convert numbers between scientific notation and standard notation if given are flawed | At least one example of a real-life situation where scientific notation could be used in provided.Examples of conversion of numbers between scientific notation and standard notation are given correctly. | At least two examples of real-life situations where scientific notation could be used in provided.Explanation of how to convert numbers between scientific notation and standard notation are given correctly  | At least three examples of real-life situations where scientific notation could be used in provided. Positive and negative exponents are included.Explanation of how to convert numbers between scientific notation and standard notation and vice versa are given correctly  |

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|  |  **1** |  **2** |  **3** |  **4** |
| ***Presentation and******Layout*** | Layout of brochure is unorganized and difficult to follow.Brochure is messy, print is often illegible. If illustrations present they distract the reader instead of helping the reader understand the planet and its laws. | Layout of brochure has some headings to help with organization. Parts are too cluttered or lack a logical structure.Brochure is neat, and print is fine lined. Few illustrations used that sometimes help reader better understand the planet and its laws. | Layout of brochure consistently used headings to help with organization. Most parts evenly spaced and have a logical structure. Brochure is neat, legible and fine lined or typed with appropriate font. Illustrations are provided which help reader better understand the planet and its laws. | Layout of brochure is professional. Headings organize information so that all parts are evenly spaced and have a logical structure.Brochure is neat, legible and fine lined or typed with appropriate font. Creative Illustrations are provided which enhance understanding of the planet and its laws and engage the reader. |