Earth Science:

NEO Impact Project

**DUE: Monday, March 25th**

**(Progress Checks Have Been Built-In… Look For The Dates**

**In This Packet!)**

*The meteoroid that came crashing down in Russia on February 15th, 2013 caused millions of dollars in damage and injured more than 1,000 people. Most those injuries were from shattered glass, but the fact that so many people were injured shows the impact events like this can have. Media from across the globe descended on Russia to cover the story. The scary part is, there are MANY more objects orbiting in our solar system right now. Some of them COULD eventually hit Earth. This meteoroid is thought to have been 50 to 60 feet wide. There are Near-Earth asteroids thought to be hundreds of feet wide. If those impacted the Earth, life as we know it could change.*

*In this project, you will be examining a Near-Earth asteroid and determining its closest and farthest point to the Earth and Sun. You will also being looking at different types of asteroids and making 3D representations of them. Lastly, you will be looking at possible methods to intercept asteroids before they strike the Earth and weighing the pros and cons of each method.*

**Near Earth Object: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Resources:**

**Information For Your Assigned Near Earth Asteroid:** [**http://neo.jpl.nasa.gov/index.html**](http://neo.jpl.nasa.gov/index.html)

**NEOShield Description:** [**http://www.neoshield.net/en/the-neoshield-project/description.htm**](http://www.neoshield.net/en/the-neoshield-project/description.htm)

**Animoto Website:** [**www.animoto.com**](http://www.animoto.com)

**Directions:**

* **The research for this project is divided into 5 parts:**
	+ **Research your assigned Near Earth Object**
	+ **Research the difference between C-type, S-type, and M-type Asteroids.**
	+ **Create 3-D models of the 3 types of asteroids… making sure their color and look is representative of the asteroid type (C, S, and M types)**
	+ **Research the difference between Near Earth Asteroid categories: Amors, Apollos, and Atens**
	+ **Research the ideas government agencies and private business have for asteroid impact avoidance**
	+ **Create an Animoto bringing all of the information together.**
* **Time will be spent in class to setup a free Animoto account. You will also be able to tour the possibilities of this cool animation creator!**

**Part 1: Research Your Assigned Near Earth Asteroid**

* Your first job is to research your assigned asteroid.
* Go to this website: [**http://neo.jpl.nasa.gov/index.html**](http://neo.jpl.nasa.gov/index.html)
* Click on the link for your asteroid.
* Then, you need to go forward or backward on the orbital animation until you find a visual representation of the following:
* The asteroid’s FARTHEST point from the SUN during 2013
* The asteroid’s CLOSEST point to the SUN during 2013
* The asteroid’s FARTHEST point from the EARTH during 2013
* The asteroid’s CLOSEST point to the EARTH during 2013
* For each of those points indicated above, you need to save the visual representation to either your H-drive or a flash drive. You will end up saving 4 pictures… one for closest to Sun, one for farthest from Sun, one for closest to Earth, and one for farthest from Earth.
* This information and the pictures will be put in your Animoto.

**Part 2: Research the Difference Between C-type, S-type, and M-type Asteroids**

The asteroid you just researched is one of many asteroids.NASA has come up with a classification system for those asteroids and others in our solar system.

* Your job is to determine:
	+ The difference between C-type, S-type, and M-type asteroids
	+ How are their colors different?
	+ What are they made from?
	+ Where in the asteroid belt would you find each type?
	+ What percent of each type is thought to be in the Asteroid Belt? Which is most common?
* This information will be put in your Animoto.

**Part 3: Research the Difference Between Amors, Apollos, and Atens**

* Research the difference between Amors, Apollos, and Atens asteroids. This is another way to classify Near Earth Asteroids.
	+ How is the classification for each different?
	+ What are the differences in each type’s orbit?
* This information will be put in your Animoto.

**Part 4: Research Ideas Government Agencies and Private Business Have For Asteroid Impact Avoidance**

* Go to this website: [**http://www.neoshield.net/en/the-neoshield-project/description.htm**](http://www.neoshield.net/en/the-neoshield-project/description.htm)
* Click on “Mitigation Measures” and “Overview”.
* There are 4 different methods talked about for asteroid impact avoidance. Also, combination methods and alternative methods are discussed.
* Your job is to become familiar with all of these methods and fill out the graphic organizer you will be given.
* Include in your Animoto at least 2 pros and cons for each of the methods listed on your graphic organizer.

**Part 5: 3D Asteroid Models Creation**

* Create 3 models… One 3D model of a C-type asteroid, one 3D model of S-type asteroids, and one 3D model of M-type asteroids.
* Each model MUST be at least 4 inches in diameter and must accurately represent each asteroid type through color and look.
* Also, label the asteroid with its type and its characteristics.

**Part 6: Animoto Creation**

* Create an Animoto that:
* \_\_\_\_\_\_\_\_ Is at least 2 minutes in length
* \_\_\_\_\_\_\_\_ Has a song related to space
* \_\_\_\_\_\_\_\_ Is engaging and appropriate
* \_\_\_\_\_\_\_\_ Includes the 4 pictures from Part 1… as well as a written explanation between pictures (for instance: picture… explanation talking about farthest distance of asteroid and date… picture… explanation talking about closest distance of asteroid and date… picture, etc)
* \_\_\_\_\_\_\_\_ Includes C-type, S-type, and M-type asteroids… how are they different (color, size, location in Asteroid Belt). Include pictures!
* \_\_\_\_\_\_\_\_ Includes Amors, Apollos, and Atens… how are they different? Include pictures!
* \_\_\_\_\_\_\_\_ Includes 4 methods of asteroid impact avoidance, combination methods, and alternative methods. MUST include 2 pros and 2 cons for each!

Progress Check Dates (Worth Homework Points… Grades Will Be Included In 4th Term Grade)

Friday, March 8th

\_\_\_\_\_\_\_\_ (10 points) Asteroid Impact Avoidance Graphic Organizer (completed and accurate)

\_\_\_\_\_\_\_\_ (10 points) Print out of the 4 pictures showing your assigned asteroids farthest point from Sun in 2013, closest point to the Sun in 2013, farthest point from Earth in 2013, and closest point to Earth in 2013

Wednesday, March 13th

\_\_\_\_\_\_\_\_ (10 points) Written out explanation of how C-type, S-type, and M-type asteroids are different… including how they’re different as far as composition, size, and color.

\_\_\_\_\_\_\_\_ (10 points) Written out explanation of Amors, Apollos, and Atens asteroids are different… including how their orbits are different.

Friday, March 15th

\_\_\_\_\_\_\_\_ (10 points) At least half of the needed elements are within the Animoto.

Earth Science Rubric: NEO Impact Animoto Project

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block \_\_\_\_\_\_\_

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| Requirement |  |  |  | Point Value |
|  Animoto:\_\_\_\_\_\_\_\_ Is at least 2 minutes in length\_\_\_\_\_\_\_\_ Has a song related to space\_\_\_\_\_\_\_\_ Is engaging and appropriate\_\_\_\_\_\_\_\_ Includes the 4 pictures from Part 1… as well as a written explanation between pictures (for instance: picture… explanation talking about farthest distance of asteroid and date… picture… explanation talking about closest distance of asteroid and date… picture, etc) \_\_\_\_\_\_\_\_ Includes C-type, S-type, and M-type asteroids… how are they different (color, size, location in Asteroid Belt). Include pictures!\_\_\_\_\_\_\_\_ Includes Amors, Apollos, and Atens… how are they different? Include pictures!\_\_\_\_\_\_\_\_ Includes 4 methods of asteroid impact avoidance, combination methods, and alternative methods. MUST include 2 pros and 2 cons for each! * 3D Asteroid Models:

\_\_\_\_\_\_\_\_\_3D model of C-type asteroid (minimum 4 inch diameter, with accurate color, size, and look)\_\_\_\_\_\_\_\_\_3D model of S-type asteroid (minimum 4 inch diameter, with accurate color, size, and look)\_\_\_\_\_\_\_\_\_3D model of M-type asteroid (minimum 4 inch diameter, with accurate color, size, and look)\_\_\_\_\_\_\_\_\_ Each asteroid model labeled properly with its type and its characteristics. | \_\_\_\_\_\_\_\_\_ (2)\_\_\_\_\_\_\_\_\_ (2)\_\_\_\_\_\_\_\_\_ (6)\_\_\_\_\_\_\_\_\_ (8)\_\_\_\_\_\_\_\_\_ (9)\_\_\_\_\_\_\_\_\_ (9)\_\_\_\_\_\_\_\_\_ (16)\_\_\_\_\_\_\_\_\_ (5)\_\_\_\_\_\_\_\_\_ (5)\_\_\_\_\_\_\_\_\_ (5)\_\_\_\_\_\_\_\_\_ (5) |  |  |  |
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Total Points: \_\_\_\_\_/72