Teacher's Guide for ODYSSEY

May/June 2013: Future of Fun

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Teacher's Note:
This guide contains project ideas, short answer, extended response, fill-in, and true/false with correction. The variation is designed to have the students think critically, as well as to test their comprehension. An answer key to the short answer sections can be found at the end of the guide.

Extended Response: Comprehension & Critical Thinking
The questions below can be used as written, simply answered in complete sentences or easily transformed into longer essay (ELA) style questions, or even research topics. In any case, have the students support their answers with details from the text or use critical thinking skills to create a thorough and interesting answer. The questions, essays and projects have been aligned with the **Common Core Standards**. Consider the level of your students when deciding how to use the questions.

"Your Brain on Fun" p. 6-9

1. What are hedonic hotspots and what is their function?
2. What kinds of neurotransmitters are released in the hedonic hotspots?
3. How did earlier experiments suggest that dopamine was chiefly responsible for the sensation of pleasure?
4. Explain how several brain regions work together to generate the amazing feeling of pleasure.
5. How do scientists judge how much rats like a particular taste?
6. Why was it more surprising to scientists to find that music and art activate the hedonic hotspot systems, as well as food, drink, sex and companionship?

"Four far-Fetched Future Fun Fantasies" p. 10-13

1. What is Stealth Assessment?

Essay: *Write about a teacher that you have or have had in the past that made every effort to mix 'fun' into the curriculum. What methods were used? What did you learn?*
2. What are rejuvenating biotechnologies?
Activity: *Make a T-chart listing the positive and negative implications of living to be 1,000 years old.*

3. Explain the idea of engineering a hybridized species.
4. What would be some of the advantages of robotic cars?

"Outta This World" p. 14-17

1. What type of 'space adventures' currently exist for people?
2. Why won't Venus likely be a destination for humans?
3. How long will a trip to Mars, the asteroid belt and the Jovian moons last?

"Fun 101" p. 18-21

1. What age bracket experiences the most boredom?
2. What problems can be associated with chronic boredom?
3. How can our level of entertainment have an affect on how quickly we become bored?
4. Why is it difficult for scientists to define and pinpoint the causes of boredom?
5. Explain the styles students use to cope with lessons that they find boring. Which category do you fit into?
6. How can you use your imagination in a constructive way when you are bored?
7. Why is it helpful to take regular breaks when doing homework?
8. Why do we perceive time as going more slowly when we are bored?
9. How can perception of an event change how bored you become during it?

"Pinball! Where Science Meets Fun" p. 22-26

1. What is the goal of the Pacific Pinball Museum?
2. What do designers take into consideration when creating a pinball game?
3. What is the function of the 'rule set' in a pinball game?
4. What is the history of pinball?
5. What is the future of pinball?

Essay: *Explain Newton's 3 Laws of Physics and how they apply to pinball machines.*

WORD BANK

flippers legs plunger playfield pop-bumpers cabinet backbox lights coin-door ball-trough auto-plunger ramps

1. Metal _____ are adjustable so you can level the game on any floor surface.

2. The _____ catches and holds balls that drain.

3. Powered by buttons on both sides of the machine, _____ revolutionized the game by giving players the ability to control the movement of the ball.

4. To launch a ball up the shooter lane and onto the playfield, you pull back and release the _____.

5. Flashing _____ on the playfield tell you what to aim for at any given moment.

6. The _____ is coated in a glossy finish and can be waxed to reduce friction.

7. _____ add excitement and accelerate the ball while it's in play by 'popping' when the ball bumps them.

8. Inserting a coin into the _____ flips a switch that activates the machine.

9. _____ add visual interest and provide access to upper and lower playfield levels.

10. The wood _____ is large enough to house all the electronic components attached to the underside of the playfield.

11. Some games have an _____, which launches the ball with the push of a button.

12. The _____ features amazing artwork and displays each player's score.

"Do Animals Giggle" p. 27-31

1. What type of pleasures does Dr. Balcombe believe that life in the wild involves?
2. How has the controversy over animals capacity to 'feel emotions' changed over the years?
3. What is the survival value in animal's play, touching and companionship?
4. In terms of nature, what is pain and what part does it play in the evolutionary sense?
5. What type of sound do dogs make when they 'laugh'?
6. Explain the behavior of 'thrill seeking' in animals.
7. What are Dr. Balcombe's reasons for living a vegan lifestyle.

"The Silliest Science" p. 42-44

1. What is happening biologically during laughter?
2. How is the brain involved in laughter?
3. What is the name for scientists who study laughter?
4. According to this article, how can laughter help society? Do you believe this to be true?
5. How can we use what is known about laughter to surmise how society may have evolved?

Activity: *Explain the three theories of laughter in your own words. Give an example of each from your own experience.*

ANSWER KEY:

"Pinball! Where Science Meets Fun"

1. *legs*
2. *ball trough*
3. *flippers*
4. *plunger*
5. *lights*
6. *playfield*
7. *pop bumpers*
8. *coin door*

9. *ramps*
10. *cabinet*
11. *autoplunger*
12. *backbox*