

## CPS – At the Dig Challenge Sheet

**Classroom set – Do not write on this sheet. Return it at the end of class for other classes to use.**

Check the overhead for your CPS team assignment for the day. Today you will be in teams of three to four.

Before we start today’s CPS problem review the 4 rules for brainstorming taped to your table with your partner. You will be expected to know these by the end of today’s activity.

This is a combination challenge. It is both task-based and performance based.

You should be sitting with your teammates where assigned.

One person from your team should be the “gofer” and needs to pick up the following materials:

- |                                  |                   |  |
|----------------------------------|-------------------|--|
| • 6 pieces of spaghetti          | • 4 inches string | • rice (small amount—clean up when you are done) |
| • 25 macaroni                    | • scotch tape     | • 2 index cards                                  |
| • 4 marbles                      | • 2 pipe cleaners | • 1 glue stick                                   |
| • 1 piece paper (computer white) | • 1 pencil        |  |
| • 6 paper clips                  | • 3 labels        |  |

You can use only these materials to complete your solution and your team must clean up and return materials at the end of the challenge.

### Background

Archeologists have made many spectacular discoveries over the years. There are many more that will follow. After a team of scientists discovers a new fossilized animal, the real challenge begins.

You “gofer” has brought you a number of different “fossil fragments.” These are all part of a new discovery made by your team.

### Challenge

This is a two part challenge.

1<sup>st</sup> – Your archeological team is challenged to “rebuild” the “fossil” animal from the parts provided as your team of archeologists believe it looked when it was alive. The team will have 10 minutes to build their new fossil animal. The evaluator will give a warning at the 8 and 9 minute points.

2<sup>nd</sup> – You team must present the name of the newly discovered and reconstructed animal and explain how your creation lived (moved, ate, etc.) in eons past. Each team has 3 minutes to present. Try to fill up your time.

### Time

Your team has 10 minutes to “build” your reconstructed fossil, name it, and create your performance

Your team has 3 minutes to present your performance with name, habits, etc.

### Scoring

Teams will be scored on...

- team work
- creativity of fossil animal
- use of materials
- creativity of explanation in performance

The teacher will score you on teamwork as you work the problem. Then more scoring will be done by the teacher and class teams as your team presents your artwork and title.

### At The Dig Scoring Sheet

Team Letter _____ Period _____	Little or none = 0	Some = 1	Full = 2	Advanced = 3
Team work <ul style="list-style-type: none"> <li>• everyone tried to offer solutions</li> <li>• organized way of putting ideas into motion</li> <li>• team presentation uses all members with respect</li> </ul>				
Creativity of fossil animal <ul style="list-style-type: none"> <li>• new fossil is unusual, different, or unique</li> <li>• new fossil is interesting</li> </ul>				
Use of materials provided <ul style="list-style-type: none"> <li>• uses items in an unusual or different way</li> <li>• most or all materials are used or included</li> <li>• items are used in unusual combinations</li> </ul>				
Creativity of explanation in performance <ul style="list-style-type: none"> <li>• integrated art work into a theme or story</li> <li>• Fossil name and behavior is unusual, innovative, and different</li> </ul>				
<b>Sub total points</b>	____/0	____/4	____/8	____/12
<b>Total points</b>	____/12			

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### 4 Rules for Brainstorming

<b>D</b>	<p><b><i>defer (put off) judgment</i></b> - <u>no criticism/no put-downs</u>            accept all ideas—you don't want to stop the flow of ideas; nothing stops the free flow of ideas like a sharp critical remark or harsh laughter from another person; judgmental attitudes cause group members to be more concerned with defending ideas than generating them</p>
<b>O</b>	<p><b><i>off-beat original ideas</i></b> are OK – <u>wild and crazy/anything goes</u>            encourage wild ideas; it is easier to tame down an idea than to think one up; group members are encouraged to be imaginative and expand their thinking; makes it fun and takes your thinking to the next level</p>
<b>V</b>	<p><b><i>vast numbers</i></b> of ideas – <u>the more ideas the better/quantity counts</u>            the more creative ideas you have to choose from, the better; the chance of finding a really good idea is greater if you have more choices; generate (create), generate, generate</p>
<b>E</b>	<p><b><i>expand/elaborate</i></b> on your ideas—<u>hitchhike/piggyback</u>            piggyback on the ideas of others; group members build on ideas of other group members; two heads are better than one; combining or adding to previous ideas opens up more ideas for the group</p>

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## 4 Rules of Brainstorming Quiz and Exemplars

Name \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

In the table below please write the 4 Rules of Brainstorming from memory.

4 Rules for Brainstorming	
D	
O	
V	
E	

Read the following examples and then list which rule for brainstorming is shown in the blank provided. Choose the rule that **best** fits the example.

1. \_\_\_\_\_ One lovely summer day in 1948, a Swiss amateur-mountaineer and inventor decided to take his dog for a nature hike. The man and his faithful companion both returned home covered with burrs, the plant seed-sacs that cling to animal fur in order to travel to fertile new planting grounds. The man neglected his matted dog, and with a burning curiosity ran to his microscope and inspected one of the many burrs stuck to his pants. He saw all the small hooks that enabled the seed-bearing burr to cling so viciously to the tiny loops in the fabric of his pants. George de Mestral raised his head from the microscope and smiled thinking, "I will design a unique, two-sided fastener, one side with stiff hooks like the burrs and the other side with soft loops like the fabric of my pants. I will call my invention 'velcro' a combination of the word velour and crochet. It will rival the zipper in its ability to fasten."
2. \_\_\_\_\_ Mestral's idea met with resistance and even laughter, but the inventor 'stuck' by his invention.
3. \_\_\_\_\_ Together with a weaver from a textile plant in France, Mestral perfected his hook and loop fastener. By trial and error, he realized that nylon when sewn under infrared light, formed tough hooks for the burr side of the fastener. This finished the design, patented in 1955. The inventor formed Velcro Industries to manufacture his invention. Mestral was selling over sixty million yards of Velcro per year. Today it is a multi-million dollar industry. Not bad for an invention based on Mother Nature.
4. \_\_\_\_\_ Thomas Edison said about the invention of the light bulb, "I have not failed. I've just found 10,000 ways that won't work."
5. \_\_\_\_\_ "If you can dream it, you can do it. Always remember that this whole thing was started with a dream and a mouse." ... Walt Disney
6. \_\_\_\_\_ The automobile is a culmination of thousands of ideas and patents beginning with rudimentary plans by Leonardo da Vinci and Isaac Newton. Before the modern gasoline engine was made common, steam engines and electric engines were experimented with. It wasn't until 1885 that the first practical automobile was invented by Karl Benz. The French were the first to manufacture a complete motor vehicle with engine and chassis, but it wasn't until Henry Ford streamlined the car manufacturing process in 1913 that car ownership became affordable for many people.

In the table below please write one example from *Far Cry* or *At the Dig* of how you and your team used each of the 4 brainstorming rules. Use your experiences with your team to help you. One example for each of the following:

<b>4 Rules for Brainstorming</b>	
<b>D</b>	
<b>O</b>	
<b>V</b>	
<b>E</b>	

In your own words explain what innovation is

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## Key for quiz – for teacher’s use

In the table below please write the 4 Rules of Brainstorming from memory.

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<b>V</b>	<i>vast numbers</i> of ideas – <u>the more ideas the better/quantity counts</u>
<b>E</b>	<i>expand/elaborate</i> on your ideas— <u>hitchhike/piggyback</u>

Read the following examples and then list which rule for brainstorming is shown in the blank provided. Choose the rule that **best** fits the example. Note take any part of the definition as long as it is clear the student knows the rule. In other words, the student doesn't have to write the whole rule phrase out.

1. O off-beat original ideas – wild and crazy/anything goes One lovely summer day in 1948, a Swiss amateur-mountaineer and inventor decided to take his dog for a nature hike. The man and his faithful companion both returned home covered with burrs, the plant seed-sacs that cling to animal fur in order to travel to fertile new planting grounds. The man neglected his matted dog, and with a burning curiosity ran to his microscope and inspected one of the many burrs stuck to his pants. He saw all the small hooks that enabled the seed-bearing burr to cling so viciously to the tiny loops in the fabric of his pants. George de Mestral raised his head from the microscope and smiled thinking, "I will design a unique, two-sided fastener, one side with stiff hooks like the burrs and the other side with soft loops like the fabric of my pants. I will call my invention 'velcro' a combination of the word velour and crochet. It will rival the zipper in its ability to fasten."
2. D defer judgment – no criticism/no put-downs Mestral's idea met with resistance and even laughter, but the inventor 'stuck' by his invention.
3. E expand/elaborate on your ideas – hitchhike/piggyback Together with a weaver from a textile plant in France, Mestral perfected his hook and loop fastener. By trial and error, he realized that nylon when sewn under infrared light, formed tough hooks for the burr side of the fastener. This finished the design, patented in 1955. The inventor formed Velcro Industries to manufacture his invention. Mestral was selling over sixty million yards of Velcro per year. Today it is a multi-million dollar industry. Not bad for an invention based on Mother Nature.
4. V vast number of ideas – the more ideas the better/quantity counts Thomas Edison said about the invention of the light bulb, "I have not failed. I've just found 10,000 ways that won't work."
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Use the definitions of innovation from the power point to assess students explanations of innovation

**The term innovation means a new way of doing something. An innovation may be a creation (a new device or process) resulting from study and experimentation. Innovation can also be a new and/or improved process.**

**Matrix for teacher for Scoring CPS At the Dig**

	Team A	Team B	Team C	Team D	Team E	Team F	Team G	Team H	Team I	Team J
<b>Period 1</b> (9 students)										
<b>Period 2</b> (9 students)										
<b>Period 3</b> (15 students)										
<b>Period 5</b> (12 students)										
<b>Period 6</b> (20 students)										
<b>Period 7</b> (16 students)										