**MCA Review Packet**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Part 1: General Science Concepts - A Crime Scene Investigation

You are the lead investigator in a double murder case that has gained national attention, and you need to be very careful as you work on this case.
Here are the facts as you know them:

* The bodies of a man and a woman were discovered in a garage
* The crime occurred in Cleveland Ohio﻿
* The bodies were discovered by a co-worker of the man after the man had missed two days of work and didn’t answer his phone.
* Both bodies show evidence of blunt force trauma injuries.
* There are signs of a struggle as a hammer, a crowbar, a shovel, and a drill were found scattered on the floor of the garage.
* The man’s car is missing, and the woman’s car is parked in front of the house.

**Step A:** What is a HYPOTHESIS?

You have to give a press conference. Write a few sentences giving your HYPOTHESIS as to what happened.

**Step B:** Testing for the murder weapon.

 One of your forensic scientists reports back to you that his review of the bodies indicates that the murder weapon has a density of roughly 2.75 gr/ cm3. Which of these is the most likely murder weapon? (Circle the correct answer)

 Hammer: Mass= 450 gr Volume= 300 cm3

 Crowbar: Mass= 1280 gr Volume= 465 cm3

 Shovel: Mass= 4100 gr Volume=1850 cm3

 Drill: Mass= 3700 gr Volume=1100 cm3

**Step C:** Start your search for suspects
 The missing car had OnStar enabled, and a quick call to the dealership help you track the vehicle to: [**42°19′N / 83°02′W**](http://www.challengerindy.org/Lessons/states/US%20map.jpg)
 This would be a good place to start your search. In which major city are these coordinates located? (Click on the coordinates to go to a US Map)

**Final Step:** Your conclusion: Write a few (3-4) sentences explaining what happened. Include:

1. The city in which the murder occurred
2. The weapon used
3. A possible motive for the crime
4. Where you would begin your investigation for suspects.

Part 2: Grade 6 Review

**Forces and Energy**: Use the information on [THIS](http://easycalculation.com/physics/classical-physics/force.php) site to answer questions 1 &2.

1. What is force?
2. To measure force we need to have data about mass and acceleration. Type the following data into the force calculator.
Mass = 50 kg
Acceleration = 2.67 m/s2

What is the force? (remember to use correct units)

1. The two main types of energy are [kinetic and potential](http://library.thinkquest.org/2745/data/ke.htm). Explain where each of these is used in roller coasters.
2. Design a [roller coaster](http://www.funderstanding.com/coaster)!

**Heat Transfer**: Use [this animation](http://www.wisc-online.com/Objects/ViewObject.aspx?ID=SCE304) to answer questions 1 & 2

1. What are the 3 ways in which energy is transferred?
2. What are 3 examples of convection as a method of heat transfer?
3. Does energy move from ‘cold to warm or ‘warm to cold’?

**Physical vs. Chemical Change**:

1. What is the difference between a [physical and chemical change](http://www.teacherbridge.org/public/bhs/teachers/Dana/chemphys.html)?
*(Answer the sample questions on the linked page as well)*
2. Take the [QUIA ‘change quiz’](http://www.quia.com/quiz/303980.html) and tell how many of the answers were physical change.

Part 3: Grade 7 Review

**Periodic Table**: Look at the Periodic Table located at: <http://www.webelements.com/>

1. What does the periodic table show?
2. Why are all the elements sorted by number?
3. All Elements are made of atoms. **Draw** a diagram of an atom, labeling all the particles.
4. How is an [element](http://videos.howstuffworks.com/discovery/29395-assignment-discovery-elements-compounds-and-mixtures-video.htm) different from a compound?

**Plant & Animal Cells**:

1. What is the difference between [Plant and Animal cells](http://www.schools.utah.gov/curr/science/sciber00/7th/cells/sciber/cellcomp.htm)?



1. Look at this picture. 🡪

Is this a plant or animal cell?
Give 3 reasons why.

**Food Webs**:

1. What is a ‘Food Web’?
2. Click on the [interactive Food Web](http://www.gould.edu.au/foodwebs/kids_web.htm) page and put together 2 of the 4 food web puzzles (Australian / African / Antarctic / Marine) on the main page, and then try the first ‘whodunit mystery’.

**Genetics**:

1. What is Heredity? (Do an online search and put the answer in your own words)
2. Click on the [Gee in Genome](http://nature.ca/genome/04/041/041_e.cfm) page. Play the “CopyCat” game, and then play “The Mighty Mutation Maker”. (*Type in your name and then select at least two of the mutations types on the left hand side of the screen to see what happens*)

Part 4: Grade 8 Review

**Plate Tectonics**:

1. Click “Play” on the [Plate Tectonics animation](http://www.worldartswest.org/plm/guide/locator/tectonics.shtml). What was the large landmass 237 million years ago called?
2. Look at this [diagram](http://www.gweaver.net/techhigh/projects/period1_2/Yellowstone/Plate%20Tectonics.html) and explain what occurs on the edges of the plates as they move?

 **Solar System**:

1. Look at the “[Make a Solar System](http://www.kidsastronomy.com/fun/make-a-solar-system.htm)” tool. Create the asteroid belt first.
What 4 planets are found between the Sun and the Asteroid Belt?

What 4 planets are found past the Asteroid Belt?
2. Take the National Geographic [Solar System Quiz](http://science.nationalgeographic.com/science/space/solar-system/space-quiz/). What is your final score?