Run off six or seven different-colored sets of Game Pieces for six or seven “Color Teams.” (Depends on how many students you have per class. Ideally, you don’t want more than 4 in a group.) Cut apart. Put in small envelopes color-coded on the front with a small color square, or clip together with all pictures/words facing inward, hidden from view.

I give the Teams one minute on a TIMER to get into their color groups, including a Runner picking up the cards. I assign a one-point penalty if they all are not seated at their team table with all chairs facing inward. Also a one-point penalty if they open the cards early or if I catch someone peeking. I also have been known to take a point off if a team has a member who is not actively participating. This encourages the malcontents or those upset for some reason to rise above it and participate. Sometimes they have a good time in spite of themselves!

Teacher says, “Ready! Set! Go!” Teams must figure out what you want them to do, then proceed to do it. Once they think they are done, they shout, “Done! Red!” or whatever their Team Color is.

I write the numbers down on the Team Game Tally Sheet. After all are done, I walk around the room, giving points to each team who is correct. If seven teams, first place gets seven points, second place gets six, etc. If first place team has one wrong they only get six points, if two wrong, five points. The only way to get zero points is to be in last place and get it all wrong. Rarely happens. Give them one minute to clip the cards together exactly as they were—or put in envelopes--then turn in game cards to teacher and get back to regular seats. Assign one point penalty if any team doesn’t get it all done within one minute. Total up the Game Points. Add to Running Total for each team you can keep on another Team Game Tally Sheet.

NOTE: The timing of transitions from Team Games back to regular classwork is vital! Using a TIMER is THE BEST WAY I KNOW and works like a charm! My student teachers never had any problem with the transition from a Quiet Classroom to a rowdy Team Game back to a Quiet Classroom. It’s all about classroom management! Once you train kids what you expect, they know what to do!
Team Game Rules

1. Teams are assigned to **Color Teams**, by their seating assignment, which changes every unit. The Red Tables are located near each other, etc. Both tables have a red colored square taped on. One of the tables also has an additional sticker of some sort, a bug sticker, for example.

2. Team members have one minute (once the Teacher has hit the timer and said go) to move themselves and chairs if needed to sit around the Team table, which has the sticker on it.

3. Every chair must be facing toward the center of the table, indicating readiness to play. 1 point deduction for a Team if anyone is facing otherwise.

4. Each Team must also send a **Runner** up to the Teacher to get the game pieces within that same minute.

5. No Team may open the game pieces before the Teacher says to begin.

6. Once the Teacher says, “Ready! Set! Go!” the team opens the envelope, spreads the game pieces out, figures out what they are supposed to do, and gets busy. Every Team member must appear to be participating. Any one that looks uninvolved, in an obvious way, will lose a point for their Team.

7. As soon as they are sure the answers are right, the Team members raise their hands, and say, “Done, Red!” or “Done, Blue!”

8. The Teacher records the Teams order of finish on the **Team Points Tally Sheet** and then checks each Team’s answers. If a team has one wrong, they drop down a level. If they were first but have one wrong, they drop to second, for example. This encourages all Teams to be careful.

9. When all Teams have been checked and awarded points, the Teacher sets the timer for one minute and each Team goes back to their seats, moving chairs and tables, if necessary. The Runner must put the game pieces in the envelope and return to the Teacher in that same minute. Any Team not completely back in their seats when the timer goes off loses a point.

10. At the end of a unit, the Teacher announces first and second places (or more, Teacher choice). They are given a **prize** of some sort, such as candy or free homework coupon, etc. The Team Games start fresh again for the next unit.
I firmly believe the TEACHER should ALWAYS assign where their students sit in the classroom, who works with whom for projects, and who is on a team for playing Team Games.

I never let kids choose their own teams because then you get all the smart kids in one team and they win everything. And vice versa. Not good!

I tell my kids that it’s always teacher choice! They mostly like this.

When I set up the new teams, the first thing I would do is to print out a grade roster of kids (totals points) so I knew who was at the top and bottom grade-wise.

I would put the top six students into six separate teams. Then the six bottom, then divide up the middle ones. This gave a good mix of students who could lead and those who were followers.

I kept track with a master class list using colored dots by their names indicating which color group they were in. I knew where to put each student so they weren’t in the same color group when reassigning. Students weren’t on teams with the same people very often. This worked GREAT! It gave every student a good chance of winning a few times each year.

If you ever have a parent arguing about this—wanting all the smart kids in one group—your best argument is this:

The smart ones will be the bosses and their employees will probably be less smart than they are. So they need to know how to work with them because they won’t have all the smart ones as their employees. (They will be bosses elsewhere!) This also works when you chose who is in what group for projects. I had great luck with this argument when the smarties would complain they were doing all the work for a group project. I would tell them they need to learn to delegate responsibility. They need to learn how to motivate others to share the work because this is in their future!
Rewards for Team Games

Question from a Teacher:

I was looking at all the fantastic games that will be played in my classroom next year. You have a points system for the games but I was curious as to what the points were used for. Do you give the students a reward for this or was it used as a quiz grade or extra credit or something. I would like to come up with something to use all those points for. Thanks :)

Answer from Marcia:

I agree that the points should be used for something! I started doing this when I taught 4th grade summer school. I used candy and students got to collect every day from a big canister filled from those big cheap bags of candy from Wal-Mart. I chose to do that when I taught high school and played the games. Because: Why not! I also added homework coupons (worth one ten-point homework page) or even special privileges, whatever you can come up with. They got a choice of either candy or coupons sometimes. Other times it was only candy or only coupons.

BUT I only awarded them at the last game of a unit. So the points built up over the length of the unit. This was easier on my budget and made them work harder to get into first or second place, which got more candy, better rewards. The best way is to give candy to everyone. First and second places get like three or two pieces (or more--your choice) and then everyone else gets one piece. This makes for a happier classroom. When you give coupons out, higher places get more points, but I wouldn't give coupons to everyone.

Be sure you check out the Team Game Tally Sheet. The Tally Sheet is for one game. The lines are the team members, which I changed every unit along with seating. Keep another Tally Sheet with the ongoing totals written on the lines. I kept all these on a clipboard.

And, I also think your idea of using them for a quiz grade might work. But for this idea you would have to be the one who ALWAYS assigns who is in what team! I never let kids choose their own teams.

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because then you get all the smart kids in one team and they win everything. I tell my kids that it's always teacher-choice. They mostly like this.

When I set up the new teams, the first thing I would do is to print out a roster of kids by grades (totals points) so I knew who was at the top and bottom and then put the top six into the six separate teams. Then the six bottom, then divide up the middle ones. I kept track with a master list using colored dots by their names in a grid so they weren’t on teams with the same people very often. Worked GREAT! This gives every student a good chance of winning a few times each year.

If you ever get a parent arguing about this—wanting all the smart kids in one group—your best argument is this:

The smart ones will be the bosses and their employees will probably be less smart then they are. So the sharper students need to know how to work with the rest of the students because they won’t have all the smart ones as their employees. They will be bosses elsewhere!

This also works when you chose who is in what group for projects. I had great luck with this argument when the smarties would complain they were doing all the work for a group project. They really do need to learn how to motivate others to share the work!
Did you hate learning Science Vocabulary as much as I did when you were a kid? Most likely, the answer is, "Yes!"

That's because most teachers taught (and still teach!) vocabulary in the old "Copy the Words and Definitions" Method.

I hated that way and always had a terrible time learning the vocabulary for each chapter!

As a teacher, I struggled for years trying to find a better method and finally came up with an active learning approach. The best part was my students actually learned their vocabulary and knew it for their vocab quizzes and tests!

The trick is to teach the vocabulary on a daily basis while you're teaching the unit, so students become familiar with the words and use them when doing labs, playing learning games, and filling out worksheets. Then the week of the test, I would finally play a Team Vocab Game in which each team had a set of cards, words on one set of cards, definitions on another set of cards. The cards were all mixed up together, each team having a different color, according to their Team Color. In the photo above, you are looking at the Orange Team playing a Vocab Matching Game.

If you listen to my Team Game Podcast you will see that after each team has successfully matched up all the words and definitions and points have been given to the Teams who were done first and were most accurate, they are asked to scramble the cards again and each Team Member then matches the cards by themselves to be sure that each Team Member knows their vocab words for that unit.

After the Teams have returned their chairs and tables to the normal positions and everybody
is back in their assigned seat, I had out the Vocab Worksheet and a long narrow strip that contains the definitions. Below in an image that shows what the vocab handout might look like. The blank spaces to the right of the words are where the definitions are to be glued. The long narrow strip is the same size as the right column but contains the definitions, out of order, of course!:

You'd be surprised how many of my students could easily match the definitions to the correct vocabulary words without any further prompting from neighbors or the teacher, and no peeking in their books or notebooks, either!

One of the most fun parts of this method, is that it works amazingly well with your included special education students! So well, in fact, that a couple of the special ed teachers in my building used this method for their self-contained classes. Any time they needed a good way to do a hands-on review of their unit's vocab, be it math, social studies, civics, you name it, they used vocab cards!

When each student was done with the Vocabulary Worksheet, they would **Line Up for Points** at the front of the room by my podium or Science cart and I got to where I would ask each student, "Are you confident of your gluing?" If they said yes, I wouldn't even check their paper, just gave them the 10 points for the page! This boosted the confidence of my students and if someone wanted to be sure, I made it okay to be sure and did a quick check. Worked like a charm and moved the line along quickly.

I've included several blank templates for you to use for your own vocabulary terms, from a five-word to an eight-word list. Feel free to use them to add your own spin on this handout and game!

I am happy to share this method of teaching vocabulary because I hate to think of any student out there having to endure the boring, time-consuming, and ultimately non-working Copy the Words and Definitions Method of learning vocabulary.

**Why not make it ACTIVE, make it FUN, and MAKE IT WORK!**

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White Board Team Games

This should be a basic activity in any Active Learning Classroom! It's FUN and REAL LEARNING takes place!

You need miniature **Team White Boards**. We made ours by cutting apart one larger one bought at a local hardware store. You can purchase ready-made ones, if you have money in your science budget! I've seen them handmade by laminating over white cardboard. You will also need a basket of erasable white board markers and erasers, enough for each team.

First, train your students to move into basic team game formation. Have one team member pick up the white board, marker and eraser. Each Team assembles in an assigned area, placing the white board so they can work on it without other teams seeing their answers.

Caution them to be careful to wait for your to countdown, which could be, “3-2-1-Show me your answer!” so as to not tip off another team to their answer.

Run White Board Games frequently, at least once a week. (They don’t have to last long.) Works great for the 13-15 year old bunch! I love to see their heads together, working out good answers.

**Examples of Team White Board Games that require heads to work together:**

1. **Metric Conversion Team White Board Game:** dictate a problem, such as “5 millimeters = ? centimeters. Give them a very short time to get it done, then, “3-2-1-Show me your answer!” Each Team gets a point if right. Be sure to throw in a weird one near the end to make a point, such as, 1 yard + 20 inches = ? feet. After they groan, you can tell they don’t really have to do it!

2. **Basic Test Review Team White Board Game:** I’ve actually used the actual test hidden in a folder on my podium, and asked actual questions or something similar. The answers are written on the white board by each team. Give them no more than 5-10 seconds, and go for the reveal!

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3. “Use Your Foldable” Team White Board Game: It’s an accepted fact that making a Foldable is NOT ENOUGH! Your students must use the Foldable in various ways to bring the material home to roost. Have each student bring their Foldable to the Team Area. Ask questions based on the Foldable, what you know will be on the unit test.

4. Safety Scenarios Team White Board Game: Go here for great simple lab scenarios:
   Students bring their lab safety contract with them. Read a scenario, give them 5 seconds to think and write down the rule number that was broken. If it’s different from what you were thinking but they can give a good argument, give them the point.

5. Unit Vocabulary Team White Board Game: Read a definition of a unit term and give them 5-10 seconds to write the word down. This would be AFTER you’ve done the Team Game Vocab Game where they match game cards of vocab and definitions and then do the Cut & Paste Vocab Worksheet. Three different great methods to review science terms right before a test!

6. Element Names and Symbols Team White Board Game: If you require them to know elements names and symbols, hold up a symbol, give them a few seconds to write the element down (correctly spelled!). You could also do the opposite!

7. Minerals Team White Board Game: Read a list of a minerals attributes, like luster, hardness, color, streak, streak or cleavage from the Mineral Identification Charts at the back of your textbook. Give the students a few seconds to write down the correct mineral name.

8. Clouds Team White Board Game: Read the description of a cloud to the class. Give them a few seconds to sketch and label the cloud. Or: Show them a larger sketch of a cloud and have them write down the name. Bonus if they can tell you if it’s water droplets or ice crystals.

9. Moon Phases Team White Board Game: Hold up sketches and ask for labels. Or describe a moon phase and ask for the phase name.

10. Half Life Calculations Team White Board Game: If you teach half life calculations, dictate a simple problem and give them enough time to make the basic calculation. This is one game where giving enough time for most teams to finish is a good thing!
When Playing a Team Game:

All Team Members must meet at assigned area with game pieces within one minute of Teacher Signal.

All Team Members must be facing toward the center of the group and participating to receive full points for a correct answer.

Use “10 inch voices,” please!

Show answer only when Teacher says, “Show Me the Answer.”

All Team Members must return to their own desk/table with game pieces returned to teacher within one minute of Teacher Signal.
When Playing a Pairs Game:
Begin on Teacher Signal.
Stay on task!
Talk only with your partner with “10 inch voices,” please!
<table>
<thead>
<tr>
<th>Rock Cycle Vocab</th>
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<tbody>
<tr>
<td>Weathering</td>
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<td>Erosion</td>
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<td>Deposition</td>
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<td>Igneous Rock</td>
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<td>Sedimentary Rock</td>
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<td>Metamorphic Rock</td>
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# Rock Cycle Vocab

<table>
<thead>
<tr>
<th>Process</th>
<th>Description</th>
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<tbody>
<tr>
<td>Rock fragments moved by some force of nature</td>
<td>when rock fragments are moved by some force of nature</td>
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<tr>
<td>Sediments pressed &amp; cemented together</td>
<td>formed when sediments are pressed &amp; cemented together</td>
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<tr>
<td>Cooling &amp; hardening of hot liquid rock</td>
<td>formed by cooling &amp; hardening of hot liquid rock</td>
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<td>Rocks broken down into smaller fragments</td>
<td>when rocks are broken down into smaller fragments</td>
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<tr>
<td>Rocks changed by heat and pressure</td>
<td>formed when rocks are changed by heat and pressure</td>
</tr>
<tr>
<td>Rock fragments laid down in a new location</td>
<td>when rock fragments are laid down in a new location</td>
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Make Your Own Vocab Review Game!

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STI Games & Puzzles Web Page

This is a document that mirrors my Games and Puzzles Web Page. Tons of Team Games to Play!

GENERAL GAME CONCEPTS

Active Learning

If you feel as if you are doing all the work, not your students, try active learning! This teaching philosophy gets your students moving. It has your students use flash cards to learn the different models of the solar system, cut and paste vocabulary, or perform skits to show the features of the three main volcano types. My hat’s off to Louis Mangione for all his inspirational training and wonderful suggestions!

White Board Team Competition

This is a basic Active Learning activity in my classroom. We have white boards, cut out of one larger one bought at a local hardware store. I train my students early on to move into four teams, send one team member to pick up the white board, marker, and eraser, and assemble in one area, placing the white board so they can work on it without other teams seeing their answers. They are careful to wait for me to count down and say, "Show me your answer!" so as to not tip off another team to their answer. I run White Board Games frequently, at least twice a week. Works great for the 13-15 year old bunch! I love to see their heads together, working out good answers.

Basic Team Games

Team Games are the best way I know to add some action and spark to the day. I play games EVERY day that I can. At least 3 or 4 times a week! kids love them and they learn so much when they are actively engaged in learning! However, you must train your students properly or, as you can imagine, chaos can reign. Not necessary if you follow a few simple steps and take the time to train your students.
Team Relay Games (Overhead Races)

Use two teams. Prepare an overhead transparency with a long line down the middle. Put the same question, puzzle, problem, on each side. Teams line up on each side of the overhead. Give each team one transparency pen of a different color. The pen is passed down the line like a relay race baton. First person in each line starts at the signal and gets to write down one thing only. If you have sentences that need correcting, for example, they only make one correction each. Then the pass the pen to the next person in the line and go to the end of the line. It's totally "legal" for team members to look at the other team's work. This often gets a team's weakest member past their turn with some dignity. Good game for requiring all the team members in the long line to pay attention to what is happening so they know what to do next.

Lab Safety Equipment Flashcard Game

Play a fun flashcard game with partners. Each pair places their set on the table. scrambled together. Then the teacher says, "Put your finger on the eye wash." Or, "Put your finger on the equipment you would use to put out a fire." Each student uses both pointing fingers, so one of the pair could get both of the eye wash flashcards. When down to just a couple flashcards, stop the game, count the piles, and shake hands with the winner!

Find Someone Who Knows Safety Hunt

Have students walk around finding students who know the answers to questions related to science lab safety. The "Someone Who Knows" must write the answer and sign their name on the student's paper. Adapted from material submitted to Successlink.org by Paula E. Young.

Safety Scenarios Game

Run off Safety Game Scenarios in six different team colors. Run off your Science Lab Safety Rules. Run four sets of these in white. Laminate. To play the game: hand
out the same scenario to each team. Hand out a set of Safety Rules Pieces. Teams put their heads together and quietly pick out all the rules that were broken in the scenario. When a team is done, they should say, "Done!" loud enough for all to hear. The teacher writes down team numbers in order of finish. When all teams are finished, the teacher quickly walks around the room checking for accuracy. If first team finished is correct, they are in first place and receive 4 points. If they miss one and the second place team gets all correct, then they change places and points, etc. (Second place gets 3 points, third place gets 2 points, etc.) I do only one Scenario at a time, but you could do several if you have time.

METRIC SYSTEM AND MEASUREMENT GAMES

Metric White Board Game

Dictate metric conversion problems. One member of each of four teams writes the problem on the white board and all team members help solve the problem without letting the other teams see their board. Hold up answers when teacher asks for them. Each correct answer gets a point.

Called Show Me the Answer here in Missouri!

Metric Mania

Great practice using the metric system! Click here for entire lesson. Includes great Metric Mania Scavenger Game!

Mini-Metric Olympics

Click here to download a pdf file with the entire mini-metric Olympics lesson plan. Even provides the "medals!" Highly recommended! NOTE: Now for sale for $3.00 by AIMS Education Foundation.

EXPERIMENTAL DESIGN GAMES

Experimental Design Vocabulary

A cut and paste vocabulary assignment. Cut out the definitions and paste with the correct word. Much more fun than the "standard" vocab sheet. The action of cutting and pasting helps most students remember better! Click here.

Exp. Design Vocab. Team Game

Run a completed "Answer Sheet" off on four different colored papers. Cut out and laminate. Teams must match the vocabu-
lary words to the correct definitions. First team done (and correct) wins!

Experimental Design Team Relay Games

Prepare an overhead transparency with a long line down the middle. Put the same question, puzzle, or problem on each side. Teams line up on each side of the overhead. Give each team one transparency pen of a different color. The pen is passed down the line like a relay race baton. First person in each line starts at the signal and gets to write down one thing only. If you have experimental designs that need correcting, for example, each student can only make one correction. Then the pass the pen to the next person in the line and go to the end of the line. It’s totally "legal" for team members to look at the other team’s work. This often gets a team’s weakest member past their turn with some dignity. Good game for requiring team members in line to pay attention to what is happening so they know what to do next.

MINERAL IDENTIFICATION GAMES (& CHEMISTRY OF MINERALS AND PERIODIC PATTERNS)

Element Flashcards

The Element Symbol Flashcards have element names on one side and the students add the symbols on the back for points, using their Element Symbols List. If two students have free time, I ask them to quiz each other. Can also play a pairs game where both sets of flashcards are in front of the pair. "Put your finger on the symbol for Iron." They can use both pointing fingers, so one of the pair could get both of the Fe flashcards. When down to a couple flash cards left, count the piles, and shake hands with the winner.

Element Symbol Bingo

Great fun! Give out blank Bingo cards to pairs. They can write in element symbols in the blanks. The quick way to make tokens is to have students rip little pieces of notebook paper. I use a packet of Element Flashcards and call them off at random. The pair that calls, "Bingo!" must match symbols to my cards to win. Prize is usually a piece of candy from my Candy Bucket.
**Patterns of the Periodic Table Skits**

Small groups of students are assigned a pattern, such as: atomic # increases L to R; atomic mass # increases L to R; metallic properties decrease L to R; Atomic radius increase top to bottom and decreases L to R; Groups of elements have similar properties (such as Halogens, Nobel Gases, Alkali Metals, etc.); Period # indicates # of energy shells, Group # indicates # of electrons in outer shell. Build a mental image in their minds beforehand of the front of the room as a huge Periodic Table. The edge of the chalkboard is Group 1A from floor to ceiling. Way over on the other side of the chalkboard, is Group 8A. The Transition Metals are in the middle. Have each group present their skit, letting the rest of the students guess which pattern they are acting out.

**Periodic Table Puzzle**

Select two teams. Give each team an enlarged version of the Periodic Table. I enlarged mine on our "Poster Machine." Cut this version apart by groups: Group 1A, 2A, etc. I include labels on small cards: the Lanthanide and Actinide Series, the Periodic Table, and the Transition Metals. Give each group the long strips and the label cards, upside down on a table, and have each group turn them over and reassemble the Periodic Table. First team done correctly, gets the point.

**Virtual Missouri Mining Map**

A Louis Mangione staple is The Virtual Map. This is **THE BEST WAY** I know to teach a map and its locations to a group of young people. Works for foreign language classes, history, geography, science, you name it! Have your students stand. You sketch a map--I do Missouri--in the air. **NOTE:** The teacher does this backwards so the map is facing the right way for the students!! Sketch the map **BIG.** I do from above my head to nearly the floor. Encourage the students to get involved. The more they are actively involved, the more they learn. We require our students to know the location of several minerals mined in Missouri. With flat hands, we trace the location of coal (northern half of Missouri), sphalerite (southwest), lead (southeast surrounding St. Francois Mountains.), etc. I repeat the outline of the map and then fill in the mineral locations. Then I just trace an area and ask the students what mineral is located here. Works great!
ROCKS AND ROCK CYCLE GAMES

Cut & Paste Rock Cycle Vocab

Click here for a nice cut & paste vocabulary review. Remember: "Big" kids get a lot out of this kind of "little" kids exercise! And because they have to think about the words, they learn much more than if they just did the customary "copy the definitions."

Rock Cycle Vocab TEAM GAME

Run a completed "Answer Sheet" off on different colored papers. Cut out and laminate. Teams must match the vocabulary words to the correct definitions. First team done (and correct) wins!

Rock Cycle Puzzle

Make flashcards showing names of different formation processes, arrows, types of rocks, characteristics of different rock types. OR Put on one piece of paper and enlarge on "Poster Machine" & cut out. Give to teams of students. They assemble into Rock Cycle Diagram with arrows showing formation processes and characteristics matched to proper rock types. Have each team assemble on a desk top for a game and/or paste to newsprint for points. Click here for Rock Cycle Puzzle. Refer to Rock Cycle Notes for proper placement of puzzle pieces.

Ride the Rock Cycle

(Created by Stacy Baker, Pleasant Hill School, Peoria, IL)

"For this activity students roll a die and travel through different stations to learn about the rock cycle. After their journey, they use the information from the "trip" to create a comic strip." Click here for Rock Cycle Worksheet. Click here for Rock Cycle Dice.

"Show Me the Rock!" Game

After both Rock Cycle Labs in which your students have learned the three rock types and their formation processes, review with this game. Each team listens carefully to your clue, such as: "Show me the rock that is made of rounded pebbles cemented by sand and clay (Conglomerate)," or, "Show me the rock that is formed by heat and pressure and has medium to coarse texture (Gneiss)." Each team picks out the rock from their lab tray that they think answers the question, sends a member up to the teacher, while hiding their rock in their hand, then reveals the rock when the teacher says, "Show me the Rock!" Point for each team that picks the correct min-
eral. They know this game, having already played the Mineral version.

WEATHERING, EROSION, & DEPOSITION GAMES

Cut & Paste Weathering Vocab

Magic trick, almost! They seem to remember their vocabulary better when they cut & paste, instead of copying definitions! Click here for blank vocab game template to make your own game using your specific definitions. Put words on left side and blank on the right. Run off a page with just the definitions on the same cards. Students cut out definitions and paste next to the correct word in the blanks on the right.

Weathering Vocab Team Game

Run a completed "Answer Sheet" off on different colored papers. Cut out and laminate. Teams must match the vocabulary words to the correct definitions. First team done (and correct) wins!

Types of Weathering Game

Each team holds two cards: Mechanical and Chemical. Teacher reads a description of a type of weathering, such as: formation of potholes in winter. (Mechanical) On a signal from the teacher, team leaders hold up the correct card. Could also offer BONUS point to teams who know the exact type, such as Frost Action (Frost Wedging.) Great fun, especially if you have several smaller teams and keep the action moving quickly.

W.E.D. Game

Similar to Types of Weathering Game mentioned above, except the teacher reads headlines from recent newspapers, such as "Landslide destroys village in South America," or "100 feared dead in Russian avalanche." Team leaders hold up correct card identifying either: Weathering, Erosion, or Deposition.

WATER SYSTEMS GAMES

Global Distribution of Water

Enlarge a diagram of a pie chart, showing the distribution of water worldwide. Make labels with small cards. Hand to each team in a closed packet. "Mark! Set! Go!" First team done correctly gets 4 points, etc.

Water Cycle Game

Enlarge a nice diagram of the Water Cycle. Make small cards with the labels. Hand to
each team in a closed packet. "Mark! Set! Go!" First team done correctly gets 4 points, etc.

PLATE TECTONICS GAMES

"Show me the Answer" White Board Game

Review parts of the Study Guide by putting students into small teams. Each team uses their white board to answer a teacher question. They keep their white boards hidden until the teachers says, "Show me the Answer!" Great fun!

Types of Plate Boundaries Skit

Divide your students into three groups. Each group is given the task of developing a skit illustrating their assigned boundary: diverging, converging, or transform/sliding. You can add further requirements such as: show movement magma/lava, show resulting features, show direction of movement. Video tape the presentations.

Name of Plates Games

Enlarge a world map showing the major and minor plates. Make labels of those you require them to memorize with small cards. Hand to each team in a closed packet.

"Mark! Set! Go!" First team done correctly gets 4 points, etc.

EARTHQUAKE GAMES

Seismic Waves Slinky Demo

Click here for one website that discusses how to demo seismic waves. Basically, use a compressional wave for P-waves, a side-to-side "snake" motion for S-waves, and up-and-down wave motion for L-waves.

Seismic Waves Skit

Have each student act out one of the three types of seismic waves. P-waves repeat this sequence: take two steps forward and one step back; S-waves repeat this sequence: take two steps to the right, then one step forward, then two steps to the left, then one step forward; L-waves repeat this sequence: take a step forward, pause, jump twice, take another step forward, pause, jump twice. Have the entire group begin at a starting line. If the students don't "cheat," the P waves should arrive at the finish line first, S-waves second and L-waves third. Good demo!
Seismic Waves Matching Team Game

Click here for a quick team game, where each team has nine pattern pieces to fit into a puzzle, which shows the main characteristics of each wave.

VOLCANO GAMES

Volcano Skits

Assign groups one of the three main types of volcanoes: composite, cinder cone, or shield. Require each group to illustrate the following in their skit: the slope of their volcano, the type of eruption, and the type of lava. They cannot talk, but can make noises, especially to make the eruption noises. Everyone has to participate for full points. Let the rest of the class guess which one is being presented instead of having a group announce it. I've seen some great stuff with this assignment and I think they remember them better.

Volcano Matching Game

Run off sets of different color cards. One set is the names of the three major volcano types. Another set is a description of the type of eruption. The third set is the type of lava. The fourth is the type of slope. Teams match the cards into the three different groups.

GEOLOGIC HISTORY GAMES

Relative Aging Team Games

A good way to introduce the concept of rock sequencing is to present each step with a separate sketch. We usually just give students the finished product and many students have trouble with seeing how the finished diagram came to be. Here are a couple of good sequencing games. I give each team the four sketches along with 4 sticky notes. They have to put the sketches in order and put a sticky label with each sketch explaining what caused the change in each sketch. Click here for the first game and click here for the second game. These are in worksheet form but can be easily converted into game pieces.

Half-Life Skit

Have the entire class stand up in the center of the room, all huddled together. Then touch the shoulders of students and have them step out of the "huddle" and stand around the outside of the room. Eliminate half at a time. As each "half-life" is com-
pleted, pause and ask them what just happened. You can either tell them what you are doing, or continue on, taking half out each time, and pausing for them to figure it out. How many half-lives to completely "decay" our class? If one half-life takes about 1 minute, how "old" is the class?

**Geologic Eras Team Game**

Click here for the game pieces. Run off on colored paper and cut out. I cut out the Eras and the characteristics separately, then have teams assemble them in order with corresponding characteristics. I also have sketches showing humans and other large mammals, dinosaurs, one-celled life, fishes (copyrighted) that I also run off as game pieces. I hand out the pieces clipped together and when they open them, I don’t tell them what to do with the pieces. "Figure out what to do." They do a great job with this! Gets them up and moving and thinking as a team!

**Geologic Eras Skit**

Assign each team of students a Geologic Era and give them 5 minutes to come up with a pantomime illustrating at least two geological and two biological events from the Era. No words or sound effects this time! Have the other students guess which Era is being dramatized. Good way to review the main geological and biological characteristics of the Eras.

**WEATHER AND CLIMATE GAMES**

**Composition of Air Team Game**

Enlarge the pie chart from the above worksheet. Print out the pie chart without words, in color. Print out the words separately. Cut out. Give to teams. Say, "On your mark! Get set! Go!" Each team assembles the pie chart correctly and raises hand when finished. Thanks to Debra Kerr for brainstorming this game with me!

**Composition of Air Team Skit**

Make quick calculations before assigning this skit. Calculate 78% of class and assign them to Nitrogen; 21% to oxygen; 1% to argon. Assign the 1% to one student even if less than 1% of your class. A catch-their-attention way to illustrate the trace gases, is to ask the 1% student to take off a shoe and throw it to the side to represent carbon dioxide and the rest of the trace gases. You can add more impact to this skit by asking the entire class to assemble themselves into a giant pie graph in the middle of the floor. Have a pile of labels and percents on cards that each sec-
tion has to grab to label themselves. Thanks to Debra Kerr for brainstorming this with me!

Layers of the Atmosphere Game

Enlarge a chart showing the layers (unlabeled) of the atmosphere. I copied a student's sketches from the above assignment and enlarged and cut them out. Each team must place the sketches in the correct layers of the atmosphere, such as: meteors in mesosphere, person in troposphere, geese in the tropopause. Great fun!

Atmosphere Mania Team Game

Similar to Metric Mania. Good review of all the different facts you'd like your students to remember about the Layers of the Atmosphere! Click here.

Layers of the Atmosphere Speed Game

Give each team a colorful chart with all the layers and pauses listed. I set the timer for 5 minutes and the teams must list as many characteristics as they can for each layer. Have the team choose the Recorder to write it all down. The rest of the team looks up as many different things as they can from their assignments. The Recorder just writes. You can make it trickier by giving points for correct characteristics, but subtracting for any wrong facts. Keeps them on their toes!

Layers of the Atmosphere Flashcards

Run off simple cards with layer names on one side. Have the students write important information on the other side, even add small sketches. Or use index cards and have students write layer names on the one side. This helps prevent them from seeing the answers through the paper. You can do all sorts of quick review games using these cards. Put them in order from the ground up. Put your finger on the layer you live in, the layer where meteors are found, the layer that contains ozone, etc. Students turn the card over to check their answer.

Heat Transfer Team Review Game

Click here for a quick team game that gets their heads together with some peer teaching thrown in for good measure. Quick but potent learning!

Heat Transfer Team Game

Click here an example of a cut-apart game. (You'll need more pictures.) Give a packet of these sketches and have them separate into three piles with sticky note
labels: radiation, conduction, or convection. Great fun to listen to them debate the game pieces and teach each other!

What is Climate?

A good way to introduce the concept of Climate. Small groups or pairs come up with a definition on newsprint. Post where all can see. Or have each group write on chalkboard in different colors. They arrive at a group definition by consensus. Post this for all to see. Main rule: can't use the book's definition! In fact, try not to let anyone open the textbook! Later discuss the definition of climate from the book.

Climate Controls Review

Cut out pictures from magazines or go high-tech and capture images of various climate controls, such as: very snowy scene (latitude), mountain scene (altitude), harbor with ocean view scene (nearness to large body of water), island surrounded by water scene (ocean currents), desert scene (center of large landmass), jungle scene (latitude), etc. Ask each team of students to identify which Climate Control is most at work in each scene. They can write answers on sticky notes. Good team game!

Worldwide Climate Zones Activity

Make 3 different color sets of laminated cards: 1 set of cards with the 11 climate names, 1 set of cards in a different color with descriptions of the 11 climates, and a third set of cards with the parts of the North American Continent areas that match the 11 climate zones. I gave the students copies of the Koppen Climate Classification System to match Climate Names with Descriptions and, also using their World Climate Zone Map, asked them to match the climate types with different areas of the North American Continent.

Climagraph Game

Print out several climographs of the United States. Have student teams match them to short climate descriptions. Good thinking exercise. Students really have to think how yearly temperature & precipitation trends would look on a graph. Click here for a climograph of Nashville. Print out climographs such as this one, minus the name of the city and the latitude/longitude information. Have them match to the correct climate name/descriptions. The correct one for Nashville is: Subtropical Moist: warm to hot summer, cool winter, precipitation all winter. You could also have the students separate the climographs into marine (low
yearly temperature range) and continental (high yearly temperature range) by looking at the temperature line graphs.

**CLOUD GAMES**

**Cloud Flashcards Game**

Have students get out their CLOUD FLASHCARDS. Work in pairs so there are two pictures of each cloud in front of the pair. Say, "Put your fingers on the cirrus cloud." Since each student can use both pointing fingers, one student could win both cirrus cards! Play until only a couple cards are left. Have pairs count their cards and shake hands with the winner!

**Cloud Matching Game**

Run off copies of Symbols and Abbreviations, Associated Weather, and Cloud Pictures, so each cloud type has a picture card, a symbol card, an abbreviation card, and an associated weather card. Have teams separate the cards into matched piles for each cloud.

**ASTRONOMY GAMES**

**Virtual Human Compass**

Turn your students into a giant compass by forming a large circle along the outer wall of the classroom. Ask them to point to North. Assign North to the student standing at the North point. Talk about how North is designated both 0° and 360°. Repeat for all the main compass points and NW, SW, SE, SW. Pick different compass points, such as 90° and ask the students to point to the point. Also give odd numbers such as 95° and ask them to point to that spot. Thanks to my dear friend, Amanda George, for this great idea!

**Virtual Human Night Sky**

While in your "Human Compass" formation, review altitude, also. Have the students point to the zenith of the sky, which is 90° azimuth. Point to the nadir of the sky, which is under your feet, directly opposite to the zenith. Point to the horizon, which is 0° azimuth. Point to 45° azimuth. Then combine azimuth and altitude. Ask such questions as, "Where in the sky is 0° altitude, 90° azimuth?" (on the horizon, due East) "Where in the sky is 45° altitude, 180° azimuth?" (halfway up, due South) Once you feel they have a working idea of
altitude and azimuth, give them the Astrolabe Lab.

**Star Wheel Game**

Fun game! Divide students into teams. Each team separates into halves and goes to opposite corners of the room with their game cards and star wheels. Give each team half a stack of cards. The cards are either quick sketches of about a dozen basic constellations or the constellation names. You give them all a puzzle to solve and the teams have to match their answers to get a point. If the answer is Orion, both the name and the sketch have to be chosen. Have team "runners" bring the answer card, hidden from view, to you on a signal, then show you the cards all at once. I color code them so matching teams are easy to see. Blue constellation sketch-blue constellation name = 1 point. I use simple questions, such as, "Which constellation is rising (or setting) at 7 p.m. on December 10th?" or "Which circumpolar constellation is overhead on June 15th?"

**H-R Diagram "March"**

Having trouble teaching your students how a star "moves" through the different parts of its life cycle and how they change position on the H-R Diagram? Tape a giant H-R Diagram on the floor. Or chalk it out on the parking lot. Include the X-Y axes, the Main Sequence diagonal, the Red Giants and Red Supergiants, and the White Dwarfs. Have students label dim and bright, hot and cool, and draw arrows to show increasing temperature and brightness along the axes. Use hockey pucks (or anything else that won't roll or blow away) to put some actual stars on the diagram. Have various students walk themselves through the life cycle of the sun and various other stars. Have them "drop off" the Diagram as they become Black Dwarves, or Black Holes, relating a star's fate to its initial mass.

**Moon Phases Flashcards**

An important objective: to recognize all eight moon phases AND be able to relate each moon phase to the relative positions of the sun, moon, and earth. I usually start with these flashcards. Label them, This alone is a challenge for most. I put a transparency up and have them refer to their textbooks. Then the FUN starts! We play the "Put Your Finger On" Game; separate into like phases, arrange in order as if they are moving around the earth, etc. Click here for one image of moon phases that could be made into flashcards.
Moon Phases Skits

Assign each team a different moon phase. Require the team to act out the moon phase for the other teams to guess. They must include the Earth and the sun in the skit. This makes them show the relative positions of the Earth, sun, and moon, which is a state requirement here in Missouri.

Note from Marcia:

Email me at mjkrech@yahoo.com if you are interested in a Dropbox download of this ebook plus the rest of my audio podcasts and Teacher Tutorials and other Science Teaching Ideas!

I am always happy to help you with any questions you might have about how to be a better teacher with active learning using such techniques as foldables, team games, and cut and paste worksheets.

It IS possible to teach with lots of games and labs without total CHAOS! Studying my Dropbox download of FREE Science Teaching Ideas can help you teach in a calm, rational, FUN, and meaningful classroom!