

**Using Jigsaw Puzzles to Make Meaningful
Assignments to Groups**

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The process of quickly getting students into small groups and quickly on-task can be challenging. One solution is to make sure that the transition itself is not only quick and smooth, but a valid learning experience in its own right. We have found that activities with jigsaw puzzles can facilitate just such transitions.

The puzzles also provide practice in using science process skills involving classification and problem-solving. Additionally, puzzles can be designed to focus on numerous other specific science content competency objectives across the K-12 grade levels. For example, we have found the puzzle activities useful in helping students learn about basic cycles affecting the earth, such as water cycles and seasons (grade 3, goal 5.2). The strategies described here are broadly applicable for teaching concepts in other content areas, as well. For example, in a recent article Huber and Lockledge (1997) provide examples of how the puzzle activities can be used in middle school science and social studies classes.

Overview of the Basic Puzzle-Grouping Activity

The strategy for using puzzles to make meaningful group assignments is very simple and the materials are inexpensive.

1. Construct a few small jigsaw puzzles and put all the pieces in one box. For example, to organize 30 students into six groups of five members each, you would need six puzzles, each of which consists of five pieces, such as the set shown in Figure 1. Design each set of puzzles as a meaningful instructional tool for a specific concept or set of concepts. For example, the puzzle set shown in Figure 1 uses the taxonomy of vertebrates as a vehicle for teaching the concept of class inclusion. Class inclusion--the idea that something can be a subset of something larger--is difficult for children to grasp and yet an important concept to teach.

-----Insert Figure 1 about here

2. Begin the transition by directing each student to pick a puzzle piece from the box, which is held above eye-level so students can't see the pieces.
3. As the students draw pieces, have them proceed to the station where their puzzle is to be assembled--with the result that each puzzle defines a group. For instance, a student drawing a puzzle piece labeled with the word "Robin" (or a picture of a robin) would become a member of the "Birds" team.
4. After a group has completed their puzzle, ask them to prepare a list of characteristics their puzzle pieces have in common. Once all the puzzles are assembled, you may ask each group to read their list while encouraging corrections or additions from other groups. To increase students' thought and reflection, be sure to allow students to explore their own ideas within their groups before beginning whole-class discussion. Designating a recorder in each group to record and report the similarities of the puzzle pieces helps keep students focused and promotes teamwork.

Children love puzzles and puzzles provide a very natural means for quickly getting them into the team spirit of their cooperative groups, as each group attempts to put its puzzle together. The activity addresses the needs of spatial, tactile, and verbal learners. Both tactile and spatial learners are likely to excel in assembling the puzzles, and the listing activity plays to the strengths of verbal learners. Perhaps most importantly, the activity can be used to teach and reinforce particularly difficult concepts--such as the concept of class inclusion in the above example. Thoughtful inquiry develops quickly as students attempt to determine what larger group their individual puzzle pieces represent.

Making the Puzzles

Perhaps one of the best general strategies to use when designing the puzzles is to use them to teach and reinforce concepts of class inclusion, as in the taxonomy example above. Repeatedly finding themselves a part of a group with subsets helps students to internalize this idea. Groups should be called by their meaningful group names as they are asked to do various assignments. For instance, one day the mammals may be asked to perform a particular task with the reptiles and the amphibians assisting. It is through this repetition that students will begin to understand that each group is a subclass of the larger group, the vertebrates. Figures 2 and 3 show additional examples of this type of puzzle set.

-----Insert Figure 2 about here

-----Insert Figure 3 about here

We recommend using wooden puzzle pieces cut with a jigsaw, if possible. These puzzle pieces are very durable and relatively inexpensive. Additionally, the wooden pieces tend to fit snugly together as the puzzles are being assembled--an especially important concern with younger children. Alternatively, laminated construction paper, poster board, or cardboard work well, though these materials are obviously less durable and more flimsy.

After constructing the Puzzles, store each individual puzzle in a plastic bag so that you can quickly pull together a puzzle set that is the correct size for the class.

Extensions

A number of enhancements and variations can be made on the basic strategy described above. For example, to minimize disruptions associated with children finding their groups, the puzzle pieces can be color-coded on the back sides of the pieces. The strategy of color-coding the puzzle pieces may be especially useful when students are first exposed to the exercise. However, in some cases you may want to avoid the color-coding because the challenge of finding the correct team members will be a central component of the activity. Consider the types of problem solving that would be involved after a student draws one of the pieces from the puzzle set shown in Figure 3 and then embarks on a quest to look for meaningful connections between that piece and those drawn by classmates.

For an additional challenge, have students make up their own puzzles. Students studying weather, for example, might design puzzles such as those shown in Figure 2. To do so, they would need to come up with ideas for categories and then search the encyclopedia or science text book for terms to put on pieces.

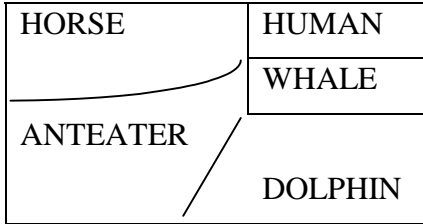
Puzzles can be as difficult as the ability of the students permit. We have found that adults as well as children can be challenged by determining the major category and the subset for the puzzles shown in Figure 3. Regardless of the level of difficulty, it is fun for children to figure out what larger group or process each group's subset represents. The fact that pieces must physically fit together ensures that the tasks remain manageable for all students and causes the activity to be "self-checking." We believe that the puzzling experience of assembling a jigsaw puzzle and explaining its meaning, as a group activity, places students quickly and enjoyably into random groups and prepares them for other science activities--while teaching and reinforcing important concepts in the process.

References

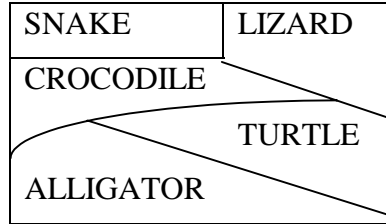
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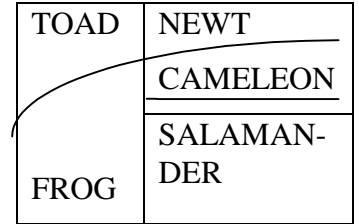
Figure1: Vertebrates



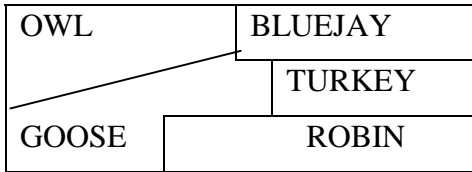
Mammals



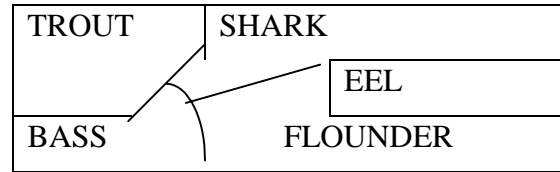
Reptiles



Amphibians



Birds



Fish

Figure 2: Weather

CUMULUS	STRATUS
	ALTO-CUMULUS
CIRROCUMULUS	CIRRUS

Clouds

SNOW	HAIL
HURRICANE	
TORNADO	RAIN

Storms

RADAR	BALLOON
	BAROMETER
COM-PUTER	THERMO-METER

Instruments

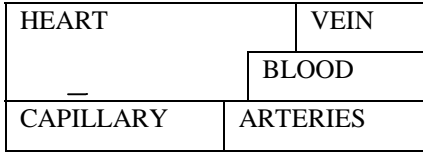
PILOT	METEOROLOGIST
RADAR	FORECASTER
OPERATOR	COMPUTER OPERATOR

Jobs

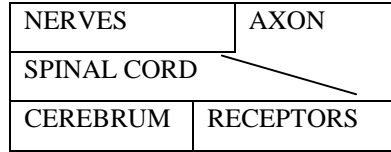
STEPPE	TROPICAL
	POLAR
DESERT	ICECAP

Climates

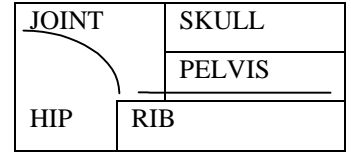
Figure 3: Systems of the body.



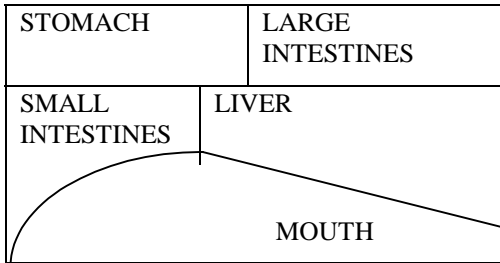
Circulatory



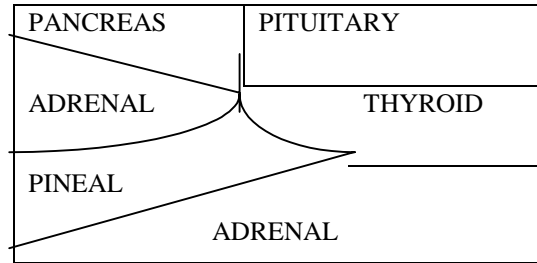
Nervous



Skeletal



Digestive



Endocrine