

College Guild
PO Box 6448, Brunswick ME 04011

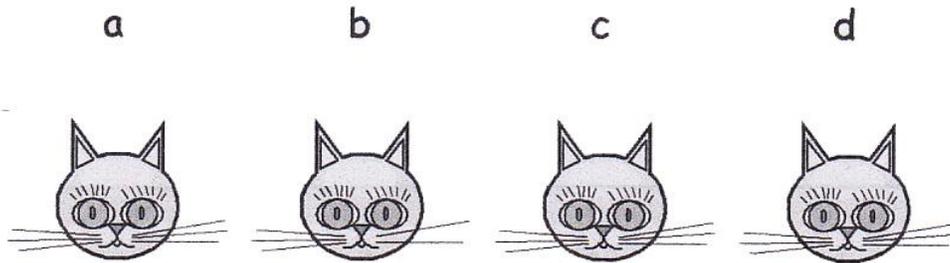
LOGIC & PUZZLES

Unit 3 of 3

PART 1 – INTRODUCTION

At some point you've probably played the game "which one of these things is not like the other." There is a group of figures – usually four – which at first glance look identical. A closer look reveals that one is different.

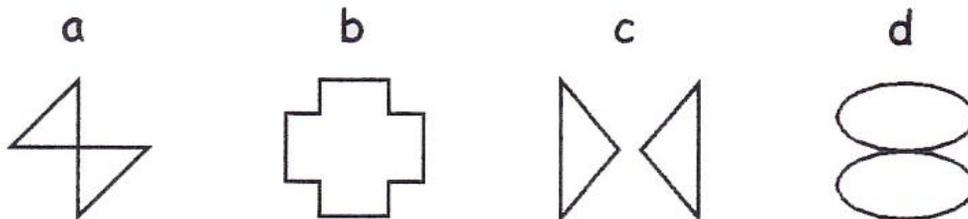
1. Which one of these things is not like the other? How so?



Such games were meant to get you to notice detail. There was always a right answer. In the question above, cat **b** is not like the other three cats: cat **b** has one fewer whiskers than the other cats do.

But consider: what if *all* of the figures were different? How would you single one of them out and decide that it doesn't belong with the other three? Asked another way, which of the three figures are most alike? Which three figures would you group together and why?

2. Which three figures are most like one another? How so?

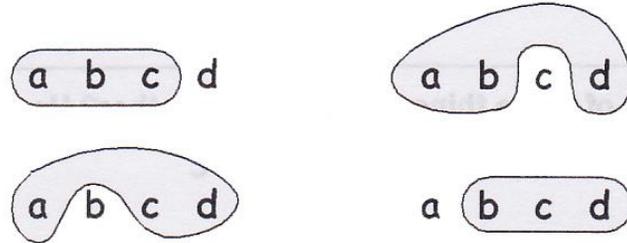


Take some time *before turning the page* to write as many different answers as you can.

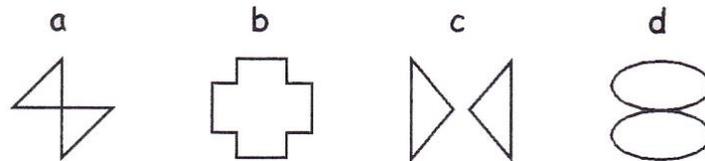
3. How many different ways are there to group three of the figures together?

Let's answer Question 3 first, and then Question 2.

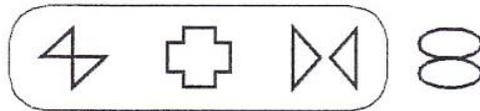
Question 3 asked, when there are four figures (a – b – c – d), how many different ways are there to group three of the figures together? The answer is there are four ways to group three figures together.



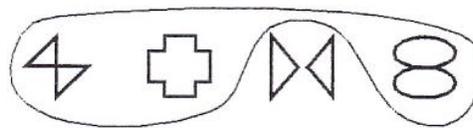
For Question 2, we can make an argument for each of the four possible groupings. Question 2 asked, which three figures are most like one another? How so?



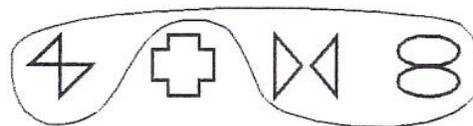
Answer #1: **a, b, and c**. These are the only figures with all straight edges.



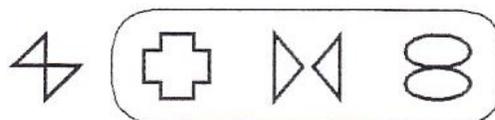
Answer #2: **a, b, and d**. These are the only figures which can be drawn without lifting the pen from the paper.



Answer #3: **a, c, and d**. These are the only figures with two distinct halves.

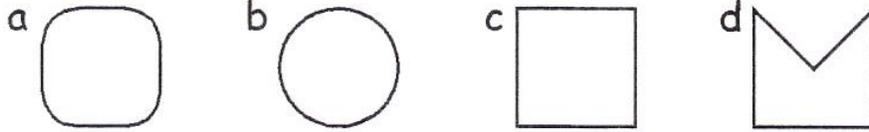


Answer #4: **b, c, and d**. These are the only figures which look the same if you flip them left to right.

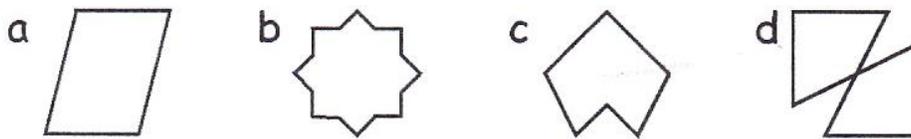


Each of the following puzzles asks the same question as our example. For each puzzle, give as many different groupings as you can. Try to give answers for all four possible groupings. A follow-up question is on the next page.

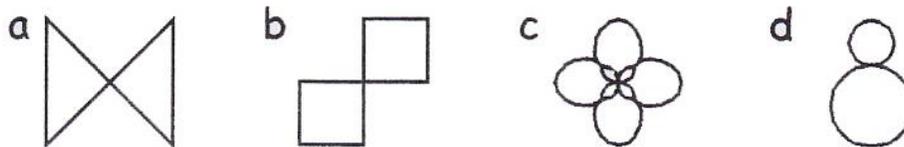
4. Which three figures are most like one another? How so?



5. Which three figures are most like one another? How so?



6. Which three figures are most like one another? How so?



7. For Questions 4, 5, and 6...

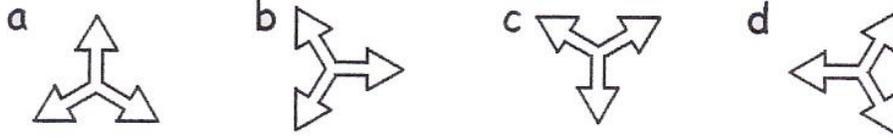
- Was it easy or difficult to find four groupings?
- Did one or two groupings come easily?
- If one or two groupings came easily, can you say why?
- If some groupings came easily, does this mean that they are in some way better answers?

Think about your answers to Question 7 to answer the next three questions.

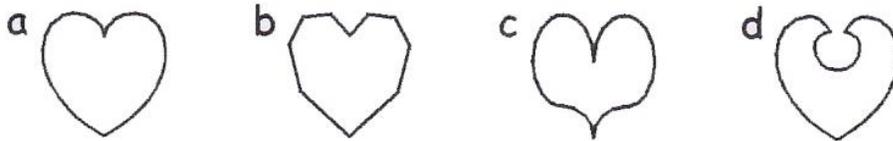
8. Which three figures are most like one another? How so?



9. Which three figures are most like one another? How so?



10. Which three figures are most like one another? How so?



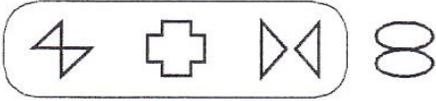
If some groupings come easily, does that make them better answers?

It's hard to say!

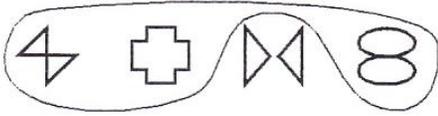
On the one hand, if a particular grouping makes sense to you (and hopefully to other people), then it is valid and is as good as any other grouping.

On the other hand, I think an argument can be made that in some sense, groupings that are easier to come up with are better. The way we group figures in the questions above shows us how we think. It is a requirement of thinking creatures like us to distinguish between things that are alike and things that are different. We must also *categorize* notions of alikeness and differentness and decide, depending on the circumstances, which categories are most important. We don't necessarily do this consciously, but we do it just the same.

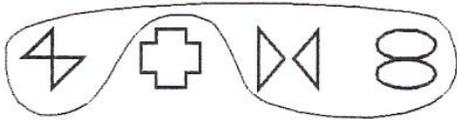
From the answers to Question 2 we can list some categories. For each answer, the grouped figures can all be placed into a unique category.



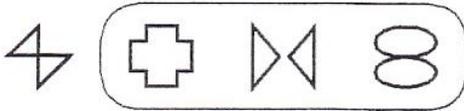
Question 2, Answer #1...The category is *STRAIGHTNESS*



Question 2, Answer #2...The category is *CONTINUITY*



Question 2, Answer #3...The category is *SEPARABILITY*



Question 2, Answer #4...The category is *LEFT-RIGHT SYMMETRY*

11. What are some other categories you used to group objects in the questions above?

12. Did you use any categories more than once? Can you go back to any of the questions and group three figures in the same way but using different categories (for example, for Question 2 Answer #4 we grouped figures b, c, and d together using the category “left-right symmetry,” but we could have grouped them using “up-down symmetry”).

Why does any of this matter?

These little puzzles reflect how we organize our thoughts and our lives, how we make decisions, why we assume things. Consider the following questions using the concept of categories. Give as many answers as you like.

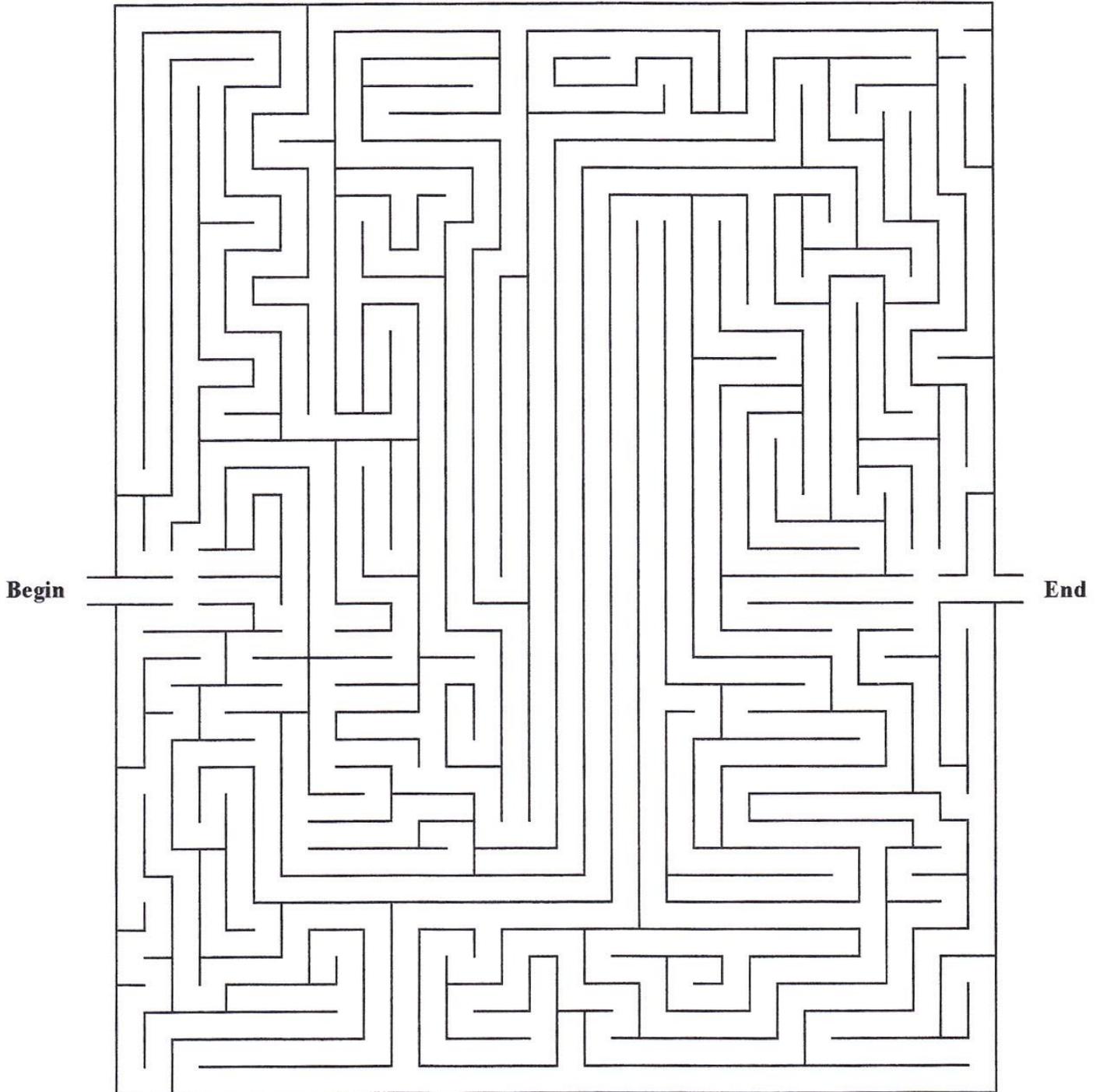
13. In a high school band, why is percussion thought of differently than all the other instruments. What makes percussion different?

14. In what different ways might you arrange various books on a shelf?

15. Of all the different U.S. coins – cent, nickel, dime, quarter, half dollar, and dollar – which is the oddest? Why?

We make split second decisions all the time about which things should be grouped, and which should be excluded. The workings in our brains are a bit like racing through this maze. When we reach End, we're done. A decision has been made. However we got there is no longer important.

16. Before you turn the page, try to get through the maze as quickly as possible.



17. How many possible ways are there through the maze? Can you go back and find other ways through it?

18. Which was the path you picked when you first raced through the maze? (Please identify it somehow if you have already gone back and traced new paths.) Why do you think you picked this first path before the others?

Our minds are like this maze. There are lots of ways to get from here to there: lots of possible decisions to make, every day. But our brain is wired such that some decisions are more easily made than others.

We are all brought up in life developing a certain set of biases. Everyone has a different set. Some biases are good and useful and others are not. These biases are like the easy ways through a maze. For good biases, this is not a problem; in fact, it is a very nice thing indeed that our good biases pave an easy way through the maze so that we can make good, useful decisions. For bad biases, the easy way through the maze is not so useful; worse, it can be very difficult to make a new decision when a bad bias is present.

19. Can you think of examples of good biases and bad biases?

20. Do you agree or disagree with the idea that biases are like easy paths through a maze? Why or why not?

Since this is your final Unit, we'd appreciate any feedback or suggestions you have for improving the Course!

Remember: First names only & please let us know if your address changes