GALT
Group Assessment of Logical Thinking

Developed by:

Roadrangka, Yeany,
and Validity of Georgia,
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Question 1 (1 point)

**Piece of Clay**

Tom has two balls of clay. They are the same size and shape. When he places them on the balance, they weigh the same.

The balls of clay are removed from the balance pans. Clay 2 is flattened like a pancake.

**WHICH OF THESE STATEMENTS IS TRUE?**

A. The pancake-shaped clay weighs more.

B. The two pieces weigh the same.

C. The ball weighs more.

**SELECT THE REASON FOR YOUR ANSWER:**

1. You did not add or take away any clay.

2. When clay 2 was flattened like a pancake, it had greater area.

3. When something is flattened, it loses weight.

4. Because of its density, the round ball had more clay in it.
Question 2 (1 point)

**Metal Weights**

Linn has two jars. They are the same size and shape. Each is filled with the same amount of water.

She also has two metal weights of the same volume. One weight is light. The other is heavy.

She lowers the light weight into jar 1. The water level in the jar rises and looks like this:

IF THE HEAVY WEIGHT IS LOWERED INTO JAR 2, WHAT WILL HAPPEN?

A. The water will rise to a higher level than in jar 1.

B. The water will rise to a lower level than in jar 1.

C. The water will rise to the same level as in jar 1.

SELECT THE REASON FOR YOUR ANSWER:

1. The weights are the same size so they will take up equal amounts of space.

2. The heavier the metal weight, the higher the water will rise.

3. The heavy metal weight has more pressure, therefore the water will rise.

4. The heavier the metal weight, the less it the water will rise.
Question 3 (1 point)

Glass Size #2

The drawing shows two glasses, a small one and a large one. It also shows two jars, a small one and a large one.

It takes 15 small glasses of water or 9 large glasses of water to fill the large jar. It takes 10 small glasses of water to fill the small jar.

HOW MANY LARGE GLASSES DOES IT TAKE TO FILL THE SAME SMALL JAR?

A. 4
B. 5
C. 6
D. other

SELECT THE REASON FOR YOUR ANSWER:

1. It takes five less small glasses of water to fill the small jar. So it will take five less large glasses of water to fill the same jar.

2. The ratio of small to large will always be 5 to 3.

3. The small glass is half the size of the large glass. So it will take about half the number of small glasses to fill up the same small jar.

4. There is no way of predicting.
Question 4 (1 point)

Scale #1

Joe has a scale like the one below.

When he hangs a 10-unit weight at point D, the scale looks like this:

WHERE WOULD HE HANG A 5-UNIT WEIGHT TO MAKE THE SCALE BALANCE AGAIN?

A. at point J  
B. between K and L  
C. at point L  
D. between L and M  
E. at point M

SELECT THE REASON FOR YOUR ANSWER:

1. It is half the weight so it should be put at twice the distance.
2. The same distance as 10-unit weight, but in the opposite direction.
3. Hang the 5-unit weight further out, to make up for its being smaller.
4. All the way at the end gives more power to make the scale balance.
5. The lighter the weight, the further out it should be hung.
Question 5 (1 point)

Pendulum Length

Three strings are hung from a bar. String #1 and #3 are of equal length. String #2 is longer. Charlie attaches a 5-unit weight at the end of string #2 and at the end of string #3. A 10-unit weight is attached at the end of string #1. Each string with a weight can be swung.

Charlie wants to find out if the length of the string has an effect on the amount of time it takes the string to swing back and forth.

WHICH STRING AND WEIGHT WOULD HE USE FOR HIS EXPERIMENT?

A. string #1 and #2  
B. string #1 and #3  
C. string #2 and #3  
D. string #1, #2 and #3  
E. string #2 only  

SELECT THE REASON FOR YOUR ANSWER:

1. The length of the strings should be the same. The weights should be different.  
2. Different lengths with different weights should be tested.  
3. All strings and their weights should be tested against all others.  
4. Only the longest string should be tested. The experiment is concerned with length not weight.  
5. Everything needs to be the same except the length so you can tell if length makes a difference.
Question 6 (1 point)

**Ball #1**

Eddie has a curved ramp. At the bottom of the ramp, there is one ball called the target ball.

There are two other balls, a heavy one and a light one. He can roll one ball down the ramp and hit the target ball. This causes the target ball to move up the other side of the ramp. He can roll the balls from two different points, a low point and a high point.

Eddie released the light ball from the low point. It rolled down the ramp. It hit and pushed the target ball up the other side of the ramp.

He wants to find out if the point a ball is released from makes a difference in how far the target ball goes.

**TO TEST, THIS WHICH BALL WOULD HE NOW RELEASE FROM THE HIGH POINT?**

A. the heavy ball

B. the light ball

**SELECT THE REASON FOR YOUR ANSWER:**

1. He started with the light ball, he should finish with it.

2. He used the light ball the first time. The next time he should use the heavy ball.

3. The heavy ball would have more force to hit the target farther.

4. The light ball would have to be released from the high point in order to make a fair comparison.

5. The same ball must be used as the weight of the ball does not count.
Question 7 (1 point)

Squares and Diamonds #1

In a cloth sack, there are

All of the square pieces are the same size and shape. The diamond pieces are also the same size and shape. One piece is pulled out of the sack.

WHAT ARE THE CHANCES THAT IT IS A SPOTTED PIECE?

A. 1 out of 3
B. 1 out of 4
C. 1 out of 7
D. 1 out of 21
E. other

SELECT THE REASON FOR YOUR ANSWER:

1. There are twenty-one pieces in the cloth sack. One spotted piece must be chosen from these.
2. One spotted piece needs to be selected from a total of seven spotted pieces.
3. Seven of the twenty-one pieces are spotted pieces.
4. There are three sets in the cloth sack. One of them is spotted.
5. 1/4 of the square pieces and 4/9 of the diamond pieces are spotted.
Question 8 (1 point)

Squares and Diamonds #2

In a cloth sack, there are

All of the square pieces are the same size and shape. The diamond pieces are also the same size and shape. Reach in and take the first piece you touch.

WHAT ARE THE CHANCES OF PULLING OUT A SPOTTED DIAMOND OR A WHITE DIAMOND?

A. 1 out of 3
B. 1 out of 9
C. 1 out of 21
D. 9 out of 21
E. other

SELECT THE REASON FOR YOUR ANSWER:

1. Seven of the twenty-one pieces are spotted or white diamonds.
2. $4/7$ of the spotted and $3/8$ of the white pieces are diamonds.
3. Nine of the twenty-one pieces are diamonds.
4. One diamond piece needs to be selected from a total of twenty-one pieces in the cloth sack.
5. There are 9 diamond pieces in the cloth sack. One piece must be chosen from these.
Question 9 (1 point)

The Mice

A farmer observed the mice that live in his field. He found that the mice were either fat or thin. Also, the mice had either black tails or white tails.

This made him wonder if there might be a relation between the size of a mouse and the color of its tail. So he decided to capture all of the mice in one part of his field and observe them. The mice that he captured are shown below.

DO YOU THINK THERE IS A RELATION BETWEEN THE SIZE OF THE MICE AND THE COLOR OF THEIR TAILS (THAT IS, IS ONE SIZE OF MOUSE MORE LIKELY TO HAVE A CERTAIN COLOR TAIL AND VICE VERSA)?

A. Yes

B. No

SELECT THE REASON FOR YOUR ANSWER:

1. 5/7 of the fat mice have black tails and 3/4 of the thin mice have white tails.

2. Fat and thin mice can have either a white tail or a black tail.

3. Not all fat mice have black tails. Not all thin mice have white tails.

4. 17 mice have black tails and 12 have white tails.

5. 21 mice are fat and 8 mice are thin.
Question 10 (1 point)

The Fish

Some of the fish below are big and some are small. Also some of the fish have wide stripes on their sides. Others have narrow stripes.

IS THERE A RELATIONSHIP BETWEEN THE SIZE OF THE FISH AND THE KIND OF STRIPES IT HAS (THAT IS, IS ONE SIZE OF FISH MORE LIKELY TO HAVE A CERTAIN TYPE OF STRIPES AND VICE VERSA)?

A. Yes

B. No

SELECT THE REASON FOR YOUR ANSWER:

1. Big fish and small fish can have either wide or narrow stripes.

2. 3/7 of the big fish and 9/21 of the small fish have wide stripes.

3. 7 of the fish are big and 21 are small.

4. Not all big fish have wide stripes and not all small fish have narrow stripes.

5. 12/28 of fish have wide stripes and 16/28 of fish have narrow stripes.
The Dance

After dinner, some students decide to go dancing. There are three boys: Albert (A), Bob (B), and Charles (C), and three girls: Louise (L), Mary (M) and Nancy (N).

One possible pair of dance partners is A-L, which means ALBERT and LOUISE.

LIST ALL OTHER POSSIBLE PAIRS OF DANCE PARTNERS. TO REDUCE THE NUMBER OF POSSIBLE ANSWERS TO THIS QUESTION, YOU CAN RESTRICT THE POSSIBLE COMBINATIONS TO BOYS AND GIRLS DANCING WITH EACH OTHER.
The Shopping Center

In a new shopping center, 4 stores are going to be placed on the ground floor. A BARBER SHOP (B), a DISCOUNT STORE (D), a GROCERY STORE (G), and a COFFEE SHOP (C) want to locate there.

Barber Shop (B)  Discount Store (D)  Coffee Shop (C)

Grocery Store (G)

One possible way that the stores could be arranged in the 4 locations is BDGC. Which means the BARBER SHOP first, the DISCOUNT STORE next, then the GROCERY STORE and the COFFEE SHOP last.

LIST ALL THE POSSIBLE WAYS THAT THE STORES CAN BE LINED UP IN THE FOUR LOCATIONS.
**GALT: Group Assessment of Logical Thinking**

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<tr>
<th>ITEM</th>
<th>BEST ANSWER</th>
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<td>1. Piece of Clay</td>
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<td>2. Metal Weights</td>
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Questions 1 – 10 are each worth one point. In order to get the one point, the subject must get both the Best Answer and the Reason correct. There is no partial credit.

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Questions 11 and 12 are each worth one point. In order to get 1 point (no partial credit) the subjects answer must:
1. Be presented in a logical manner
2. Contain no fewer than 1 error/omission for question 11 and 3 errors/omissions for question 12

11. The Dance

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12. The Shopping Center

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