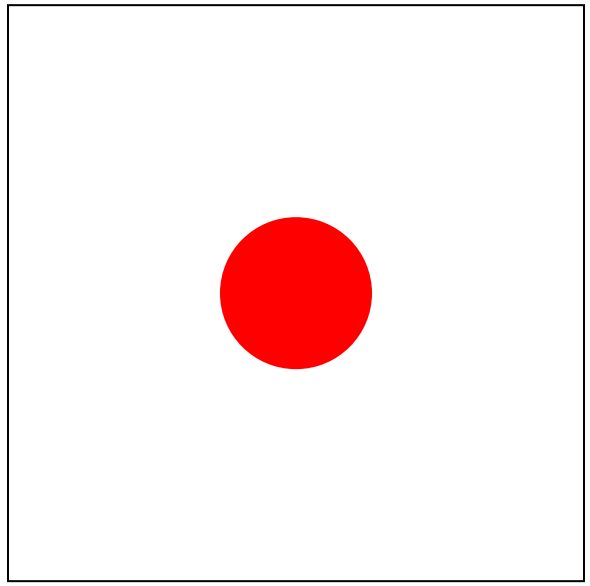
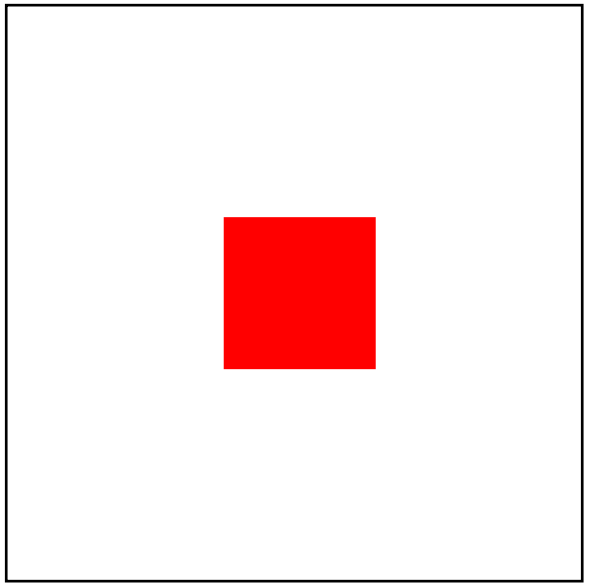
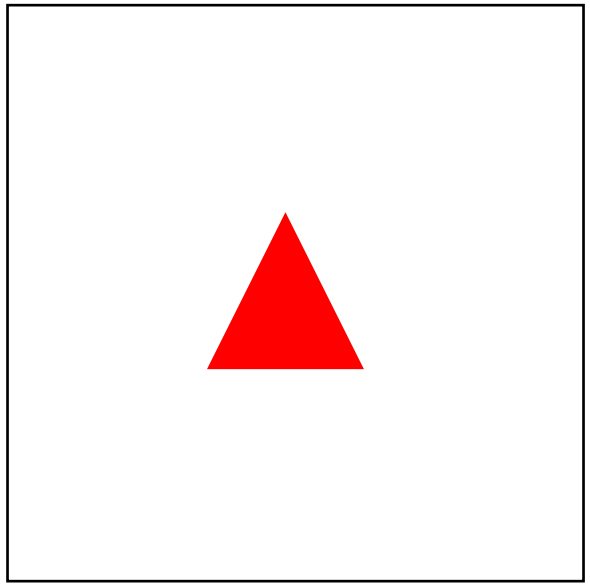
Pre-Test

Test Knowledge of Dimensions

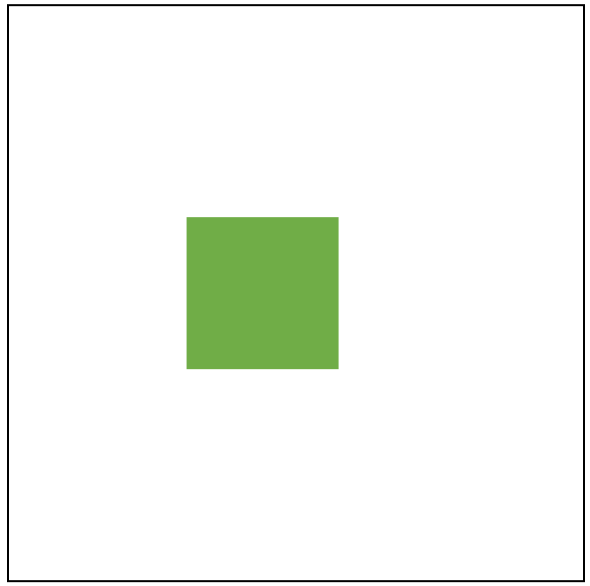
Shape: Touch the picture with a [shape 1 / shape 2 / shape 3]. Note: The shapes should be replaced with the universal shapes.

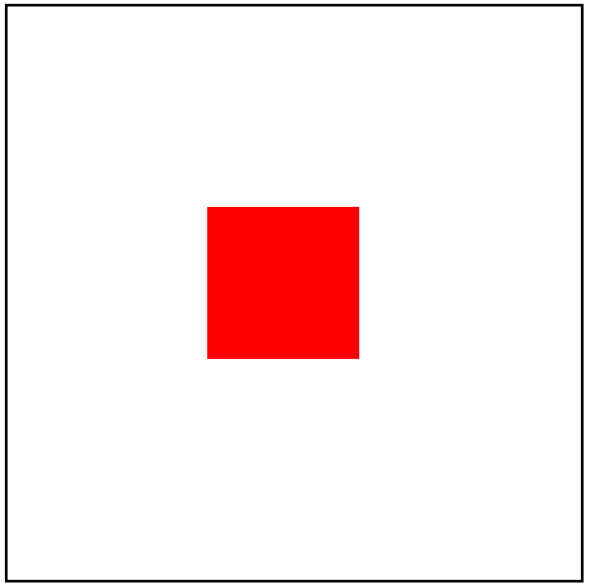


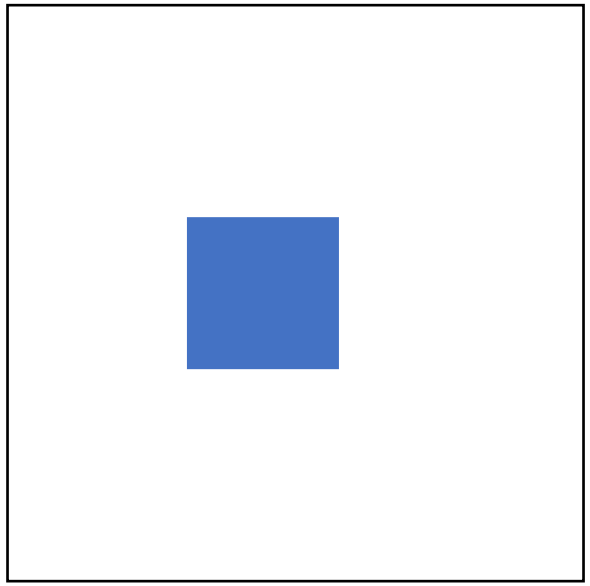




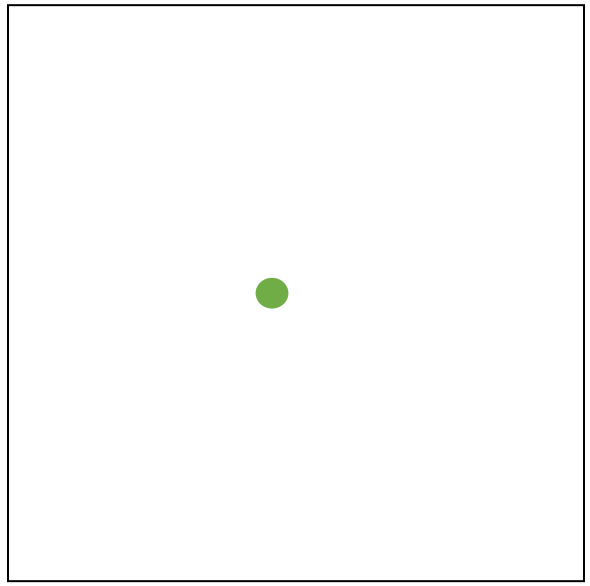
Color: Touch the picture that is [red / green / blue].

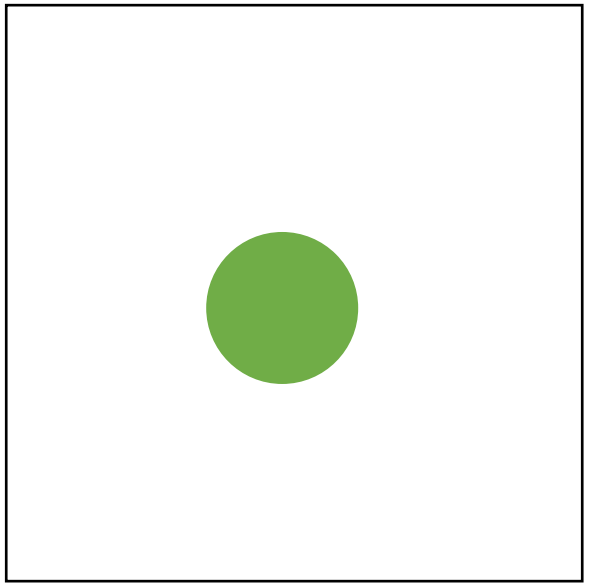


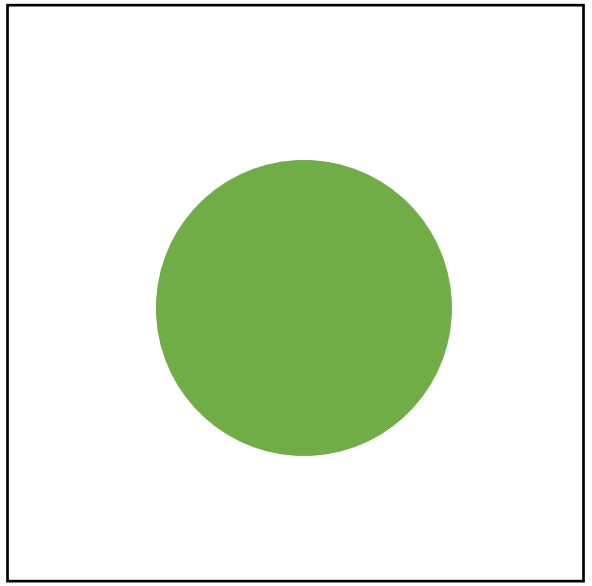




Size: Touch the picture with [big / medium size / small] shapes.



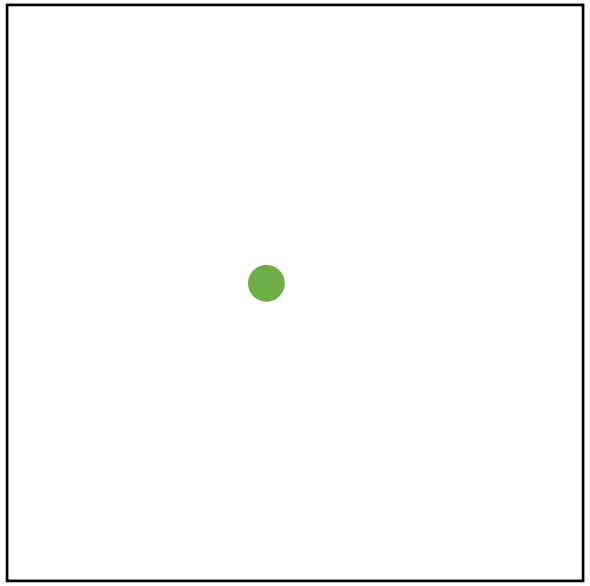


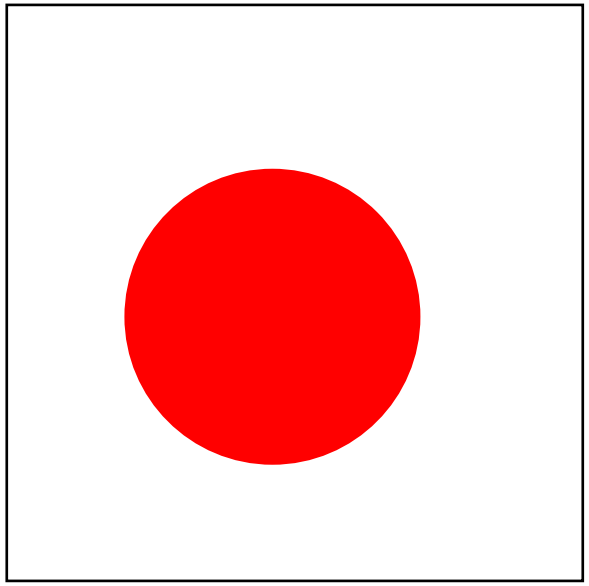


Block 1: Something’s the Same

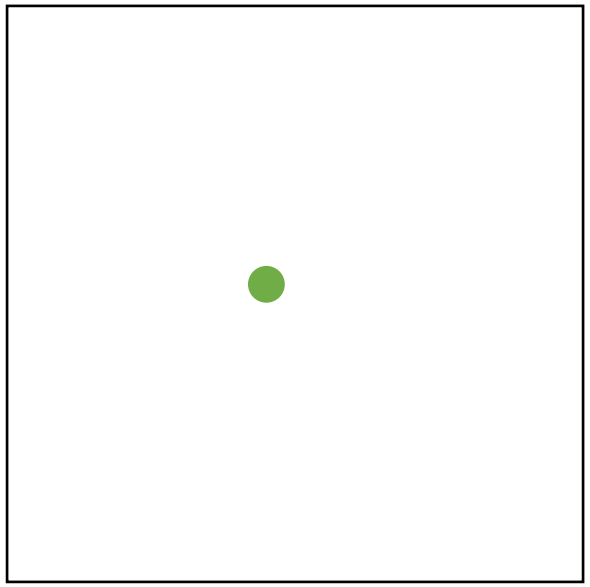
3 cards. 3 dimensions. One question. Two matches, and the first match is provided to the child.

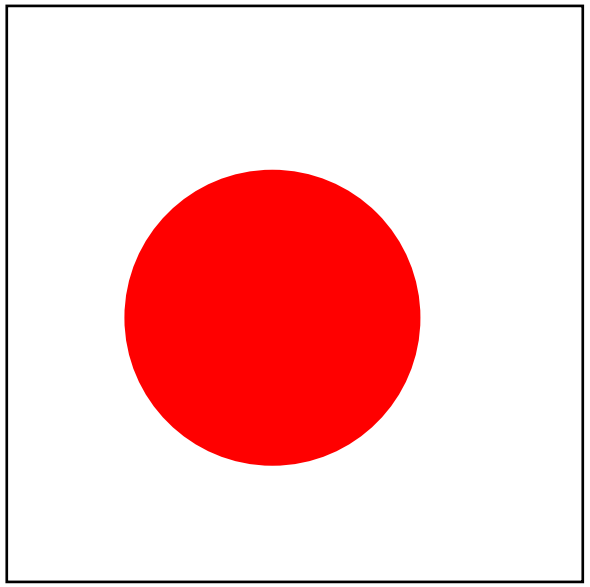
Here are two pictures. Something's the same. They are both [shape].

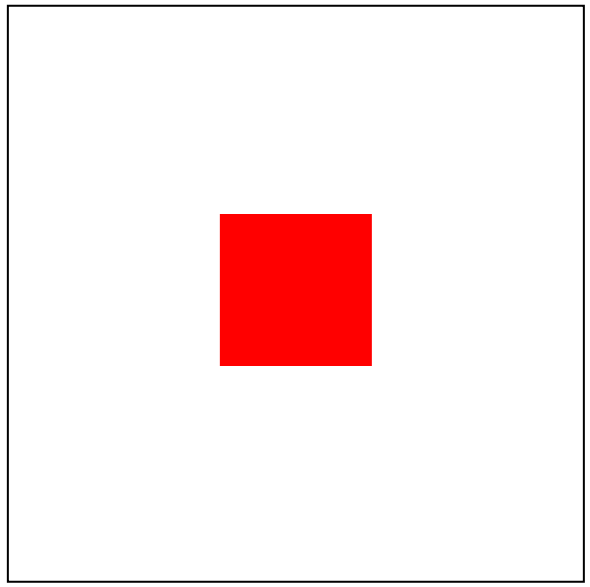




Here is another picture. Which of these two pictures [point to two pictures] is the same as this one [point to the new picture]?







Example Stimuli

Trial	Card 1	Card 2	Card 3
1	Shape 1 Red **Small**	**Shape 2** Blue **Small**	**Shape 2** Green Large
2	Shape 1 **Red** Small	Shape 2 Blue **Medium**	Shape 3 **Red** **Medium**
3	Shape 1 Red **Small**	Shape 2 **Blue** **Small**	Shape 3 **Blue** Large
4	Shape 1 **Red** Small	Shape 2 **Red** **Large**	Shape 3 Green **Large**
5	**Shape 1** Red Small	**Shape 1** Blue **Large**	Shape 3 Green **Large**
6	Shape 1 **Blue** **Small**	Shape 2 **Blue** Medium	Shape 3 Green **Small**

Something's the Same (STS) Performance

- Family Life Project
  - 48-months: M = .41, SD = .60
  - 60-months: separate factors were needed for each dimension. "A wide range of difficulty was observed for the STS items although the group of items was, on average, relatively easy for children to complete."
- EF Touch in Kenya.
  - 4- and 5-year-olds: M = .66, SD = .15. Floor effect = 0%. Ceiling effect = 2%.

Block 1 Notes

- Expected accuracy is 50% when randomly guessing.
- It may be possible to make the task even easier by having more than one dimension of similarity for the test pair.
- Hypothesis: Due to shape bias, shifting may be more difficult when shape is used for the example and/or easier when it is used for the test pair.

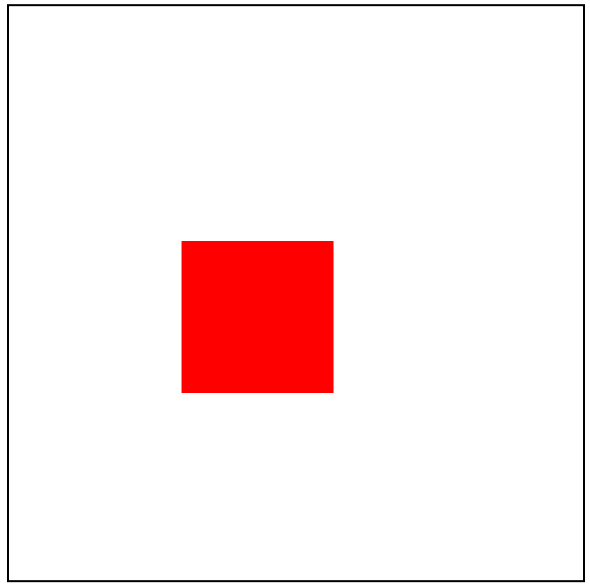
Something's the Same (STS) Description

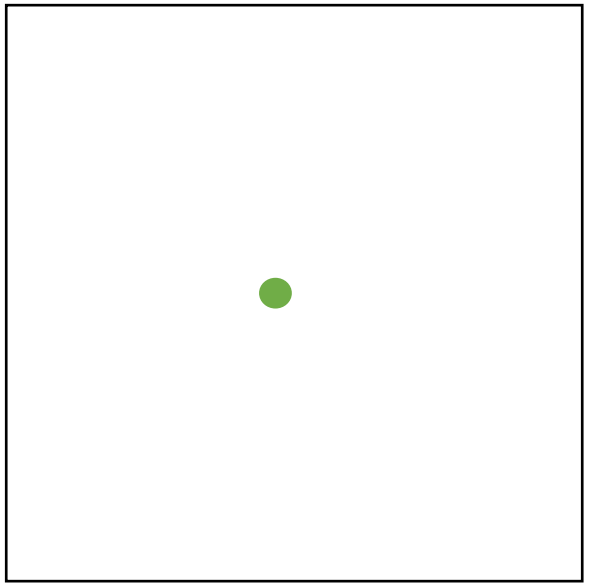
This task, which was modeled on the Flexible Item Selection Task developed by Jacques and Zelazo (2001), is intended to assess attention shifting. In the version of the task developed for flipbook administration, children are first presented with a page on which there are two line drawn items that are similar in terms of shape, size or color. The examiner draws the child's attention to the dimension along which the items are similar, stating "See, here are two pictures. These pictures are the same, they are both (cats, blue, big, etc.)". The examiner then flips a page which presents the same two items again, to the right of which is a dashed vertical line and a picture of a third item. The new third item is similar to one of the first two items along a second dimension that is different from the similarity of the first two items. For example, if the first two items were similar in terms of shape, the third item would be similar to one of the first two items in terms of either size or color. When presenting the new, third item to the child the examiner states to the child, "See, here is a new picture. The new picture is the same as one of these two pictures. Show me which of these two pictures is the same as this new picture?" This task is preceded by a pretest in which children demonstrate knowledge of color, shape, and size.

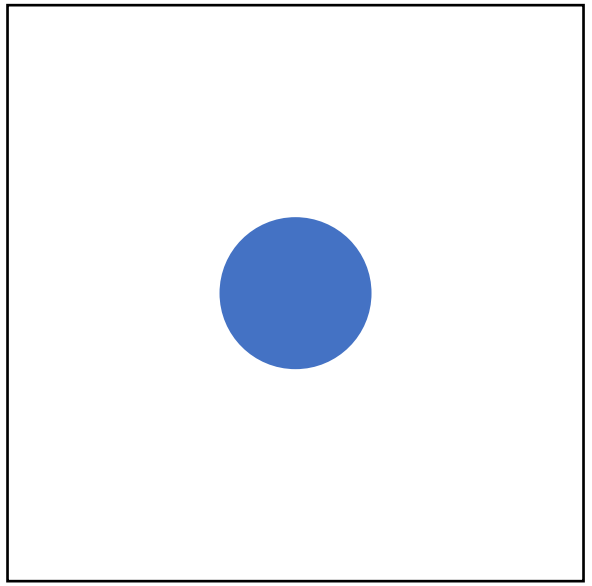
Block 2

2-Match (*Flexible Item Selection Task* Instructions)

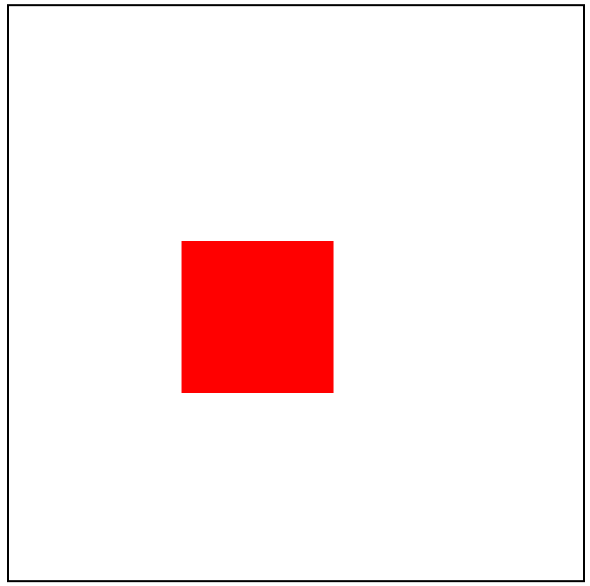
Question 1: Touch two pictures that are the same.

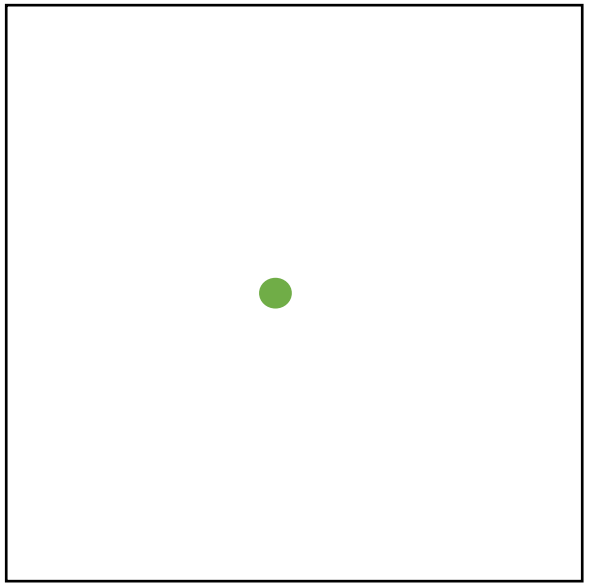


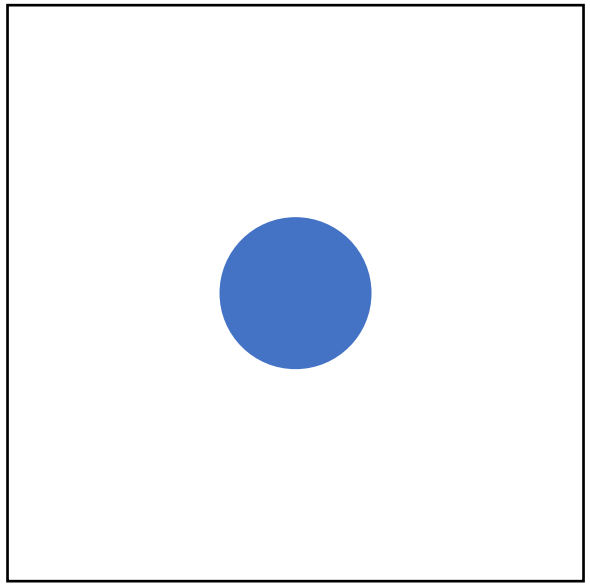




Question 2: Touch two pictures that are the same in a different way.







FIST Performance (ceiling by age 8)

* 1st selection performance is close to ceiling by age 4. 2nd selection (shifting) is much harder.

- Jacques & Zelazo (2001)
  - 12 trials. 2nd selection accuracy estimated from graphs. 3yo M = .41; 4yo M = .33; 5-yo M = .50.
- Blair et al (2005) Head Start
  - 16 trials. Accuracy **probably** includes 1st and 2nd selection. 4- and 5-year-olds: M = .67, SD = .24
- Marcus et al (2020) high SES
  - 15 trials. 1st and 2nd selection. M age (months) = 62, SD = 11. M = .93, SD = .10.
- Dick (2014)
  - 6 trials. 2nd selection accuracy estimated from graphs. 6yo: M = .72, 8yo M = .93, 10yo M = .95, adult M = .97

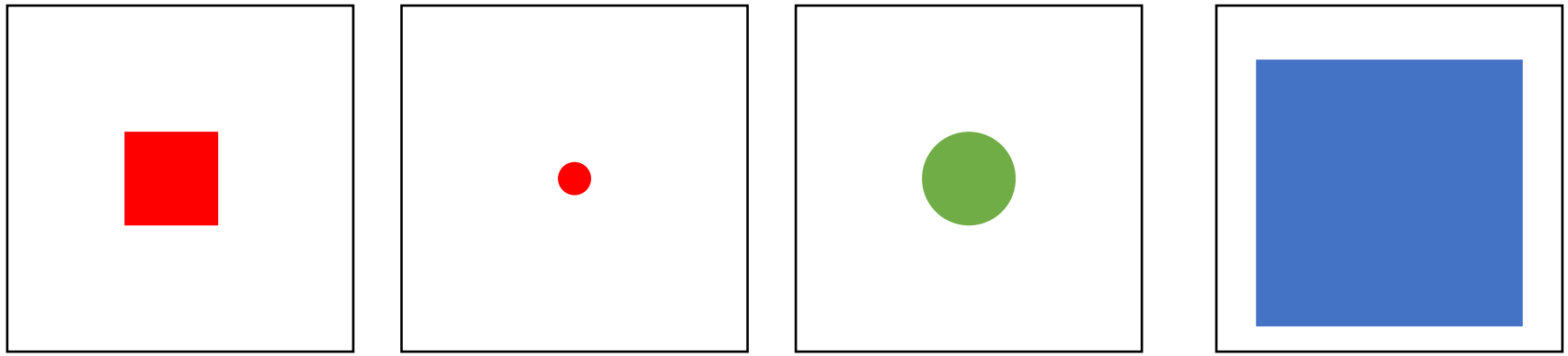
Block 2 Notes

- Using a table top version, performance on the first test question is close to 100%, even for very young children.
- Performance on the second question reaches ceiling around age 5-6.
- There are multiple ways to get this wrong (e.g., repeating the same choices for the second question, choosing an incorrect pair for either question).
- Stimuli can be drawn from the same set as Block 1.

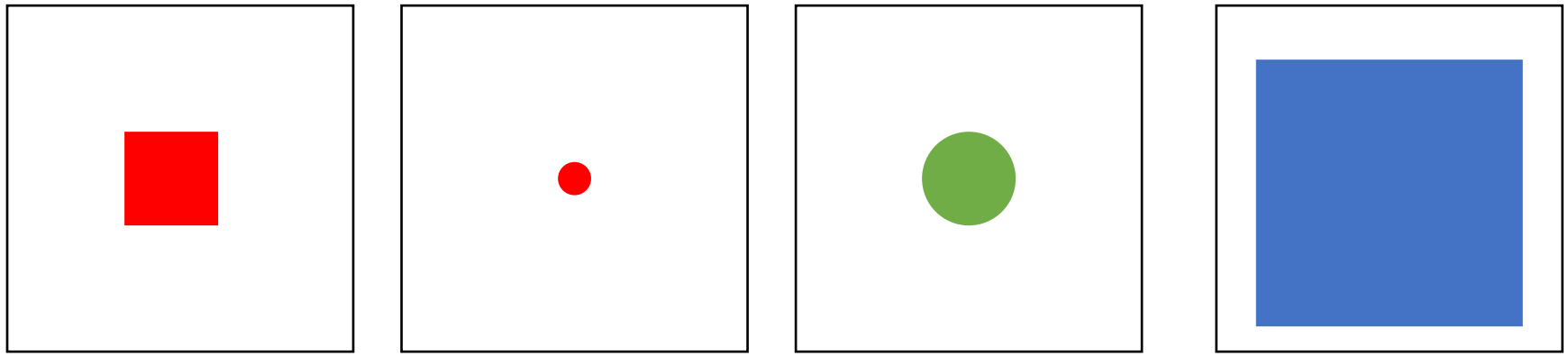
Block 3

3-Match: Use four cards with three matches.
This should optionally introduce cardinality (number) as a dimension.

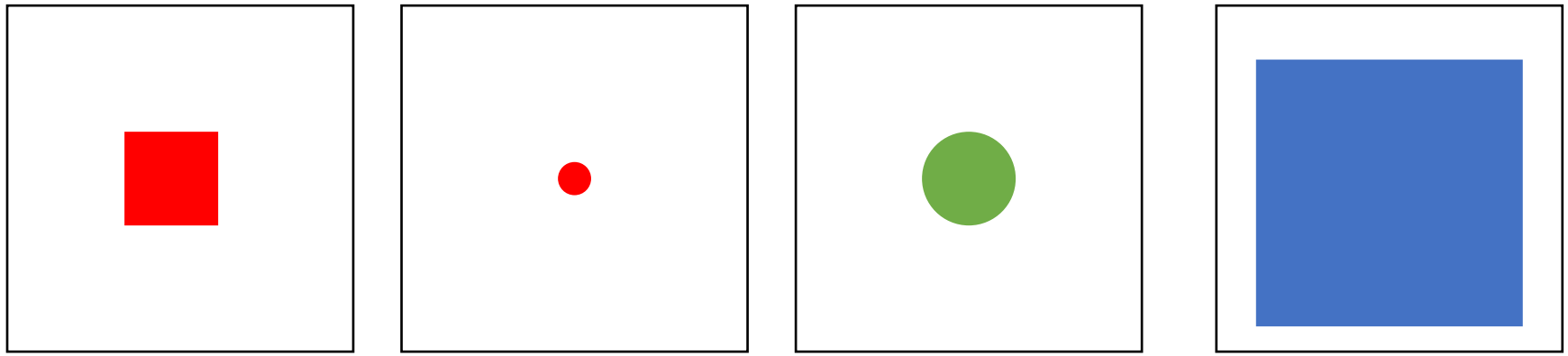
Question 1: Touch two pictures that are the same.



Question 2: Touch two pictures that are the same in a different way.



Question 3: Touch two pictures that are the same in a different way.



Example Stimuli

Trial	Card 1	Card 2	Card 3	Card 4
1	**One** Shape 1 **Red**	**One** **Shape 2** Blue	Three **Shape 2** Green	Two Shape 3 **Red**
2	One **Shape 1** **Red**	**Two** Shape 2 Blue	**Two** Shape 3 **Red**	Three **Shape 1** Green
3	**One** **Shape 3** Red	**One** Shape 2 **Blue**	Three **Shape 3** **Blue**	Two Shape 1 Green
4	One Shape 1 **Red**	**Three** Shape 2 **Red**	**Three** **Shape 3** Green	Two **Shape 3** Blue
5	One **Shape 1** Red	**Two** **Shape 1** Blue	Three Shape 3 **Green**	**Two** Shape 2 **Green**
6	**One** Shape 1 Red	Two Shape 2 **Blue**	Three **Shape 3** Green	**One** **Shape 3** **Blue**

Block 3 Performance

All info from Dick (2014). Two versions (A, B) as described in slides at end. Both of these versions are distinct from our Block 3 version. Accuracy is estimated based on graphs. 6 trials.

3rd selection

6yo. A = .42, B = .50

8yo: A = .67, B = .63

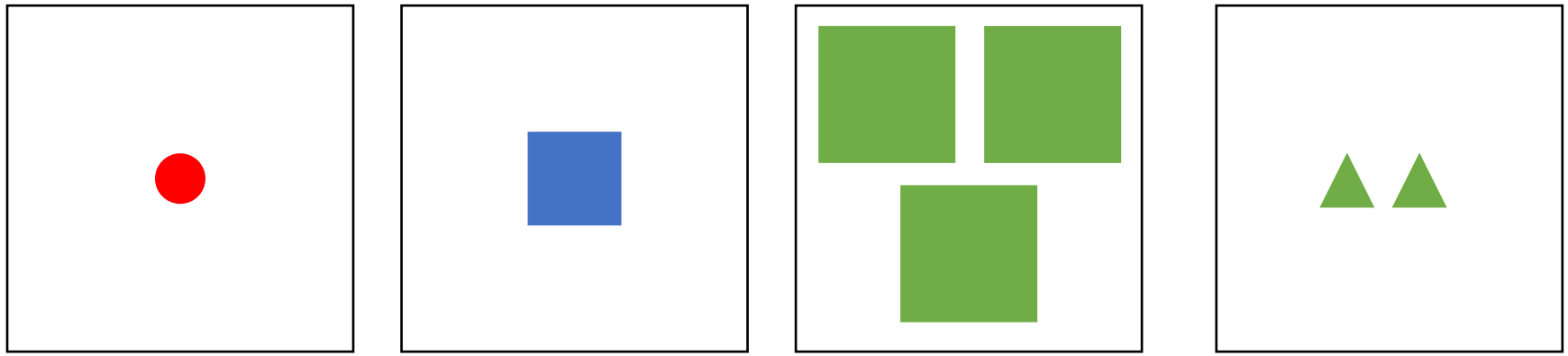
10yo: A = .87, B = .82

adult: A = .90, B = .88

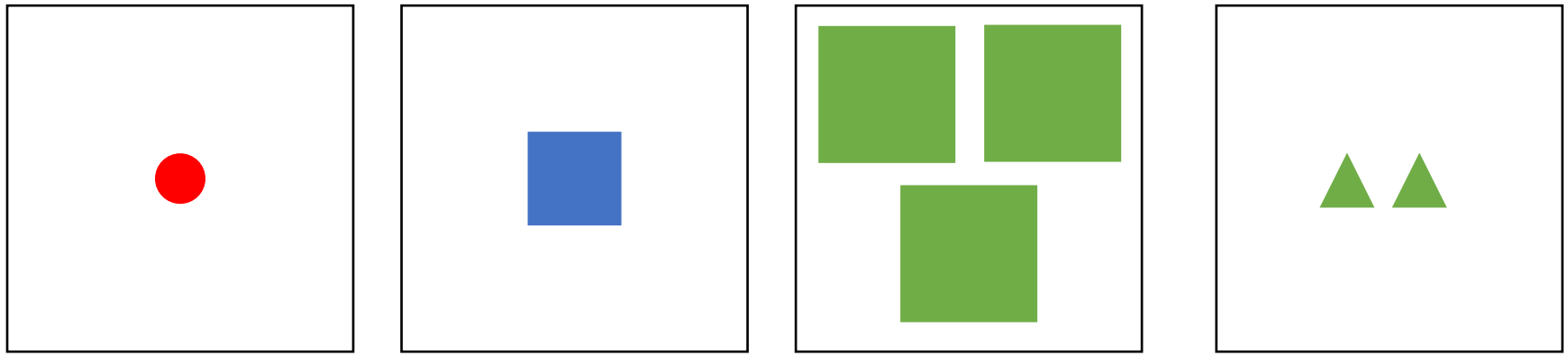
Block 4

4-Match: Uses Four Cards - 4 pairs; 4 dimensions including cardinality

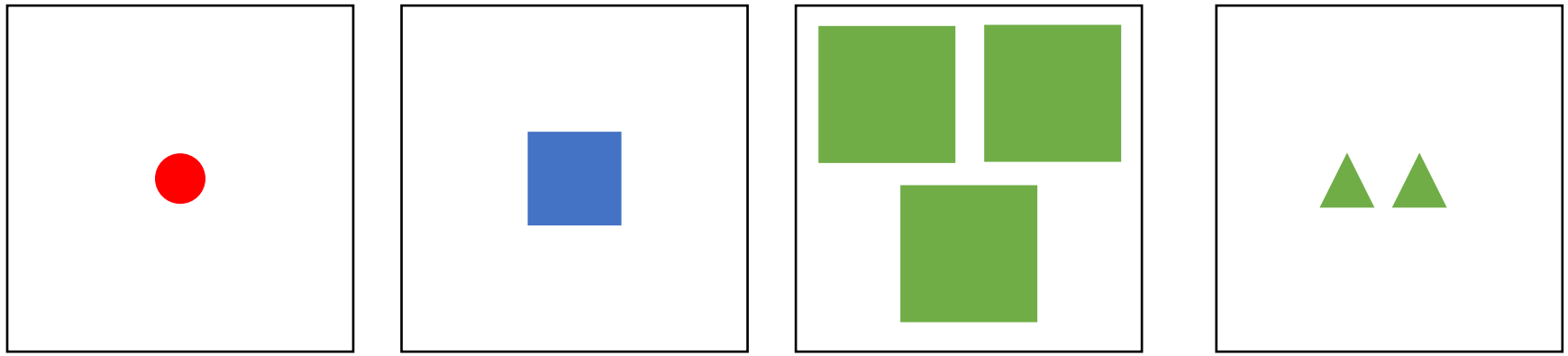
Question 1: Touch two pictures that are the same.



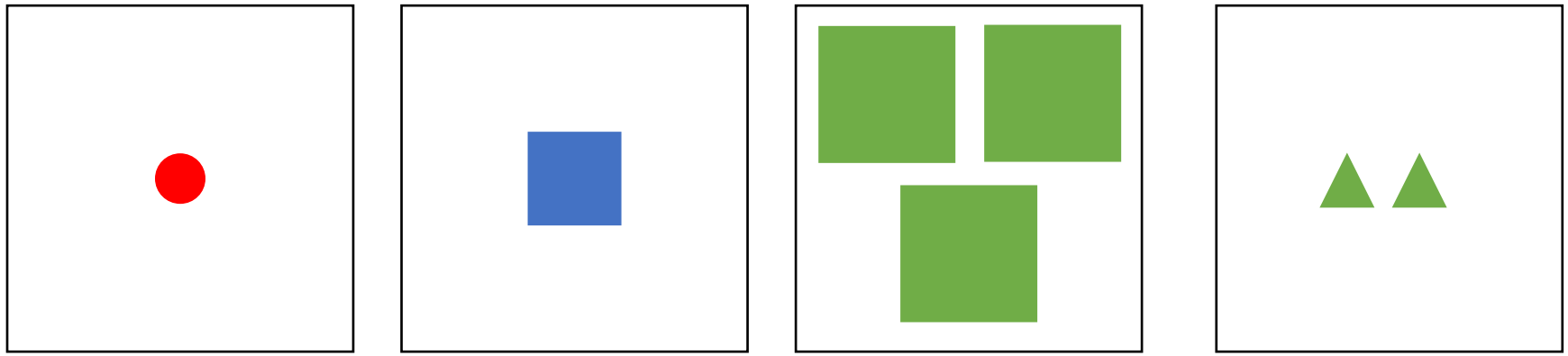
Question 2: Touch two pictures that are the same in a different way.



Question 3: Touch two pictures that are the same in a different way.



Question 4: Touch two pictures that are the same in a different way.



Example Stimuli

Trial	Card 1	Card 2	Card 3	Card 4
1	**One** Shape 1 Red **Small**	**One** **Shape 2** Blue Medium	Three **Shape 2** **Green** Large	Two Shape 3 **Green** **Small**
2	One Shape 1 **Red** Small	**Two** Shape 2 Blue **Medium**	**Two** **Shape 3** **Red** Large	Three **Shape 3** Green **Medium**
3	**One** **Shape 1** Red **Small**	Two Shape 2 **Blue** **Small**	Three Shape 3 **Blue** Large	**One** **Shape 1** Green Medium
4	One Shape 1 **Red** Small	**Three** **Shape 2** **Red** **Medium**	**Three** Shape 3 Green Large	Two **Shape 2** Blue **Medium**
5	**One** **Shape 1** **Red** Small	Two **Shape 1** Blue **Large**	Three Shape 3 Green **Large**	**One** Shape 2 **Red** Medium
6	One **Shape** 1 **Blue** **Small**	**Two** Shape 2 **Blue** Medium	Three Shape 3 Green **Small**	**Two** **Shape 1** Red Large

Block 4 Performance

All info from Dick (2014). Accuracy is estimated based on graphs.
6 trials.

4th selection

6yo. M = .20

8yo: M = .48

10yo: M = .75

adult: M = .83

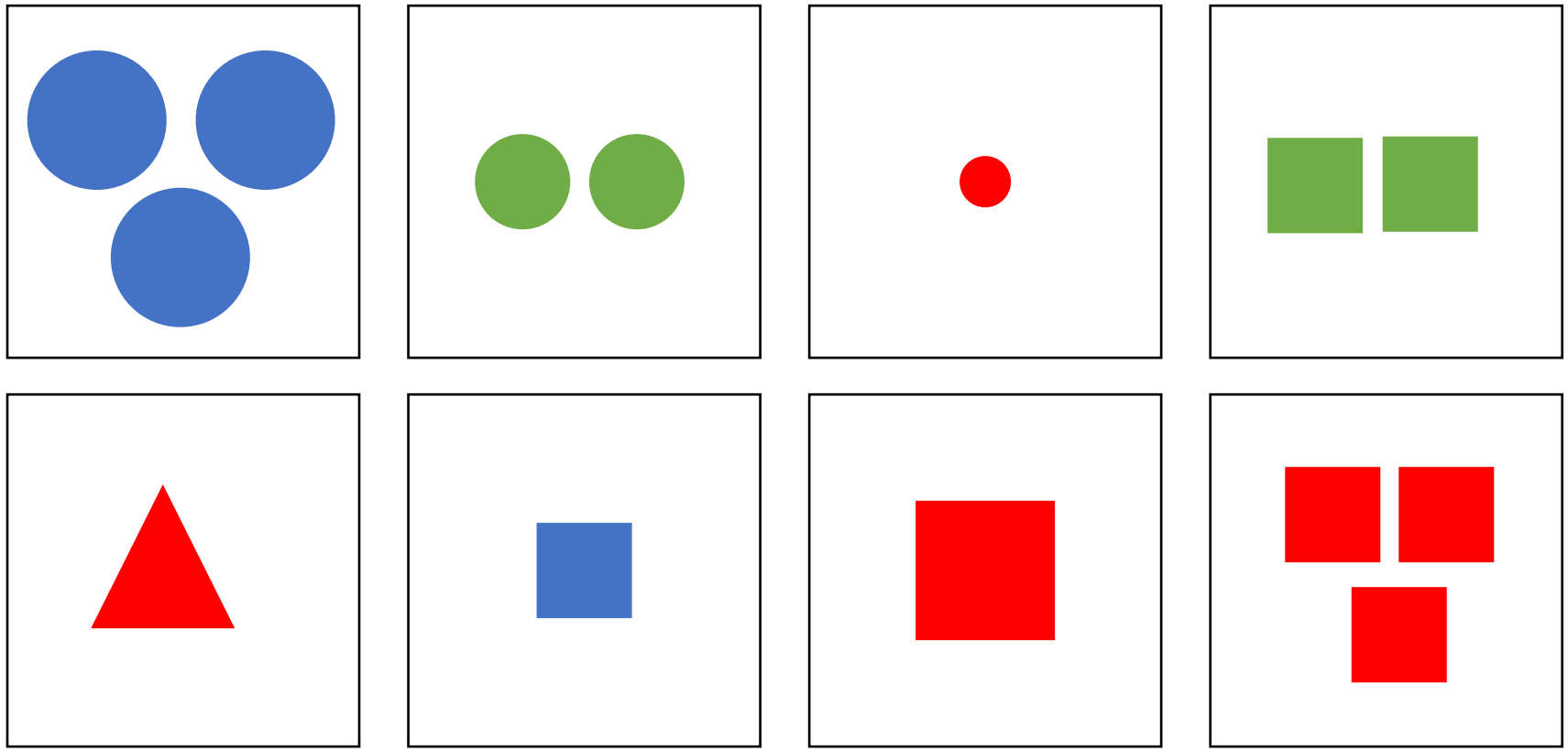
Block 4 Notes

- Using this version, we can choose whether or not to allow multiple matches for the same pair of pictures (e.g., card 2 and card 4 for trial 4 on the “Example Stimuli” slide).

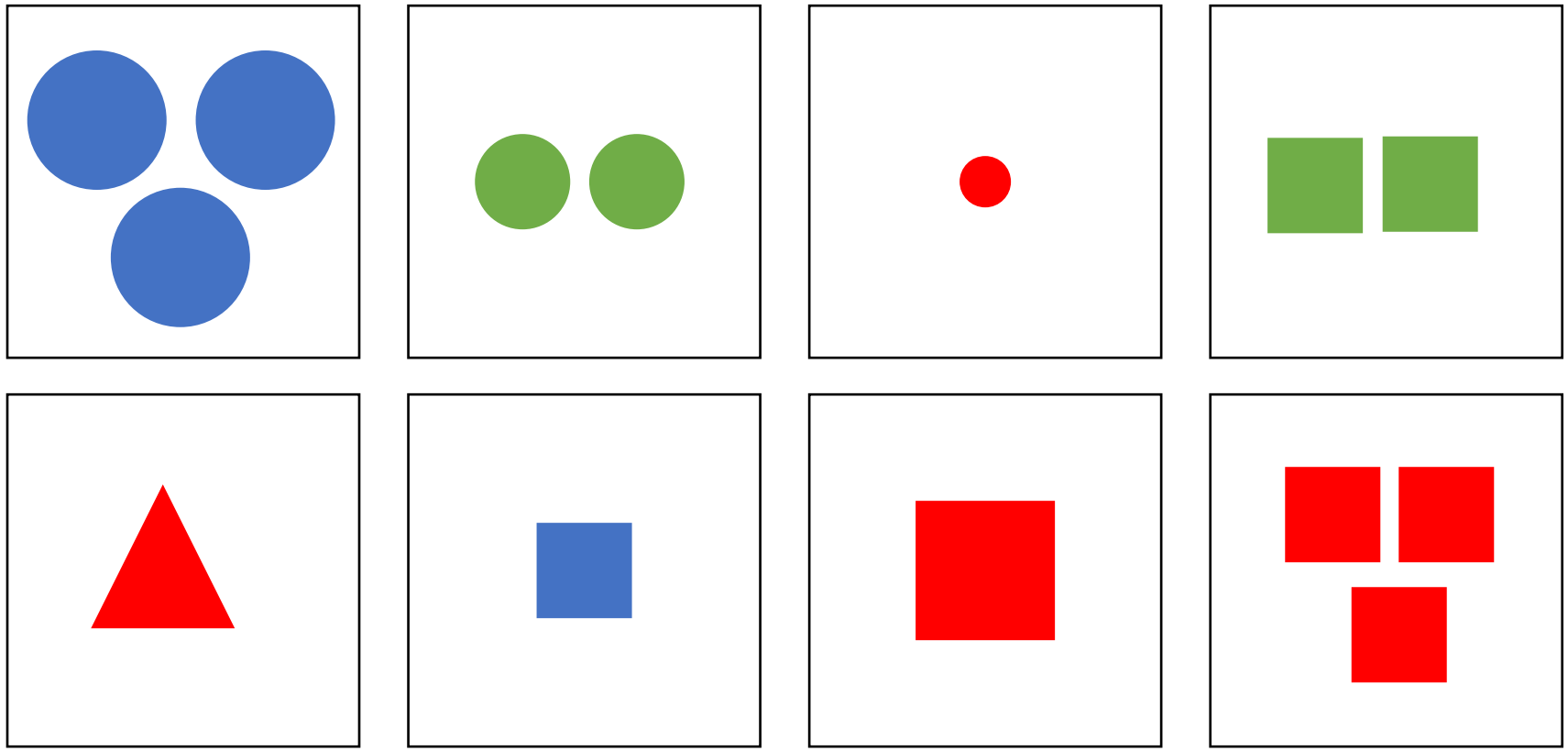
Block 5

Loosely modeled after the “set” game

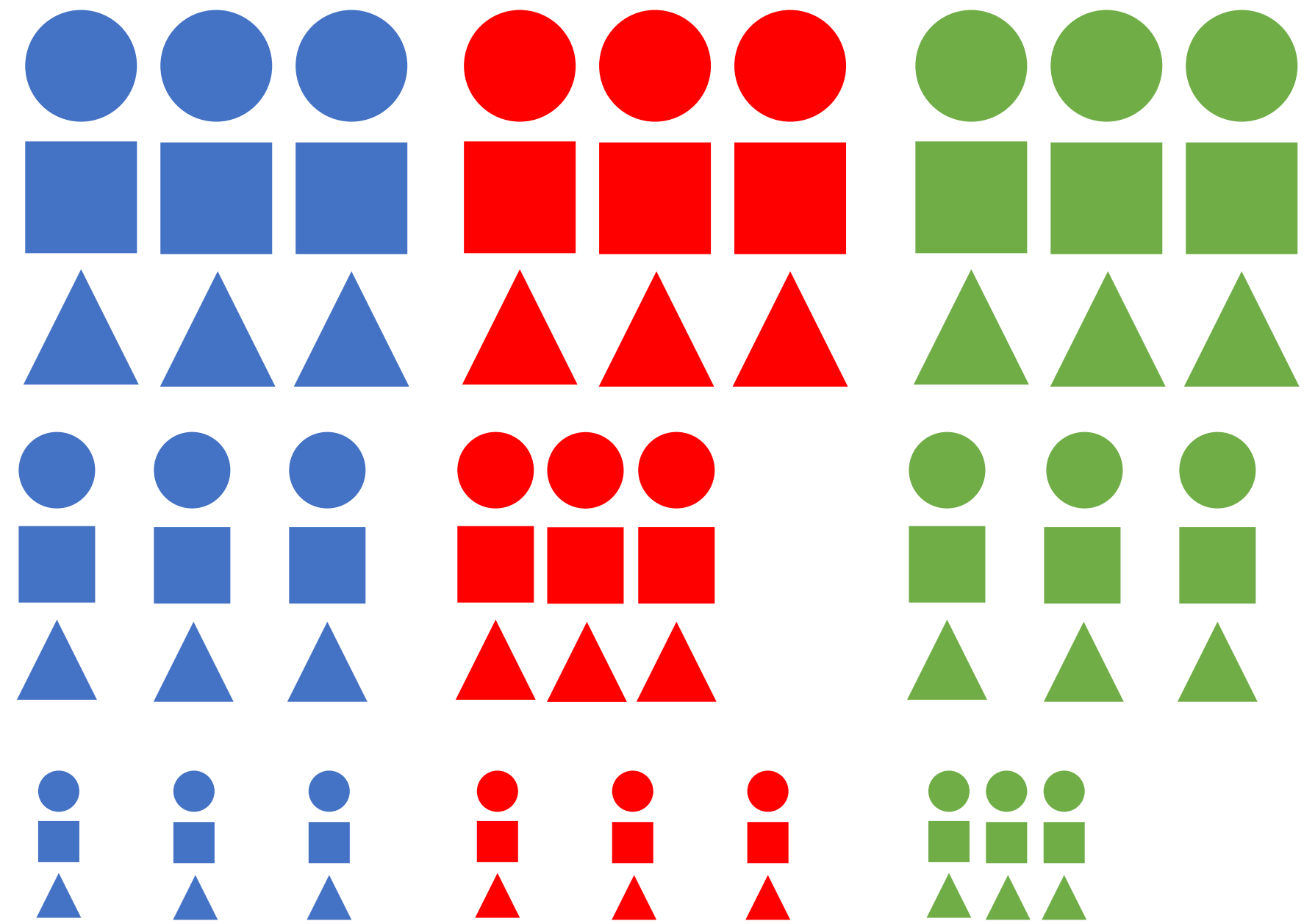
Question 1: Touch three pictures that are the same in only one way.

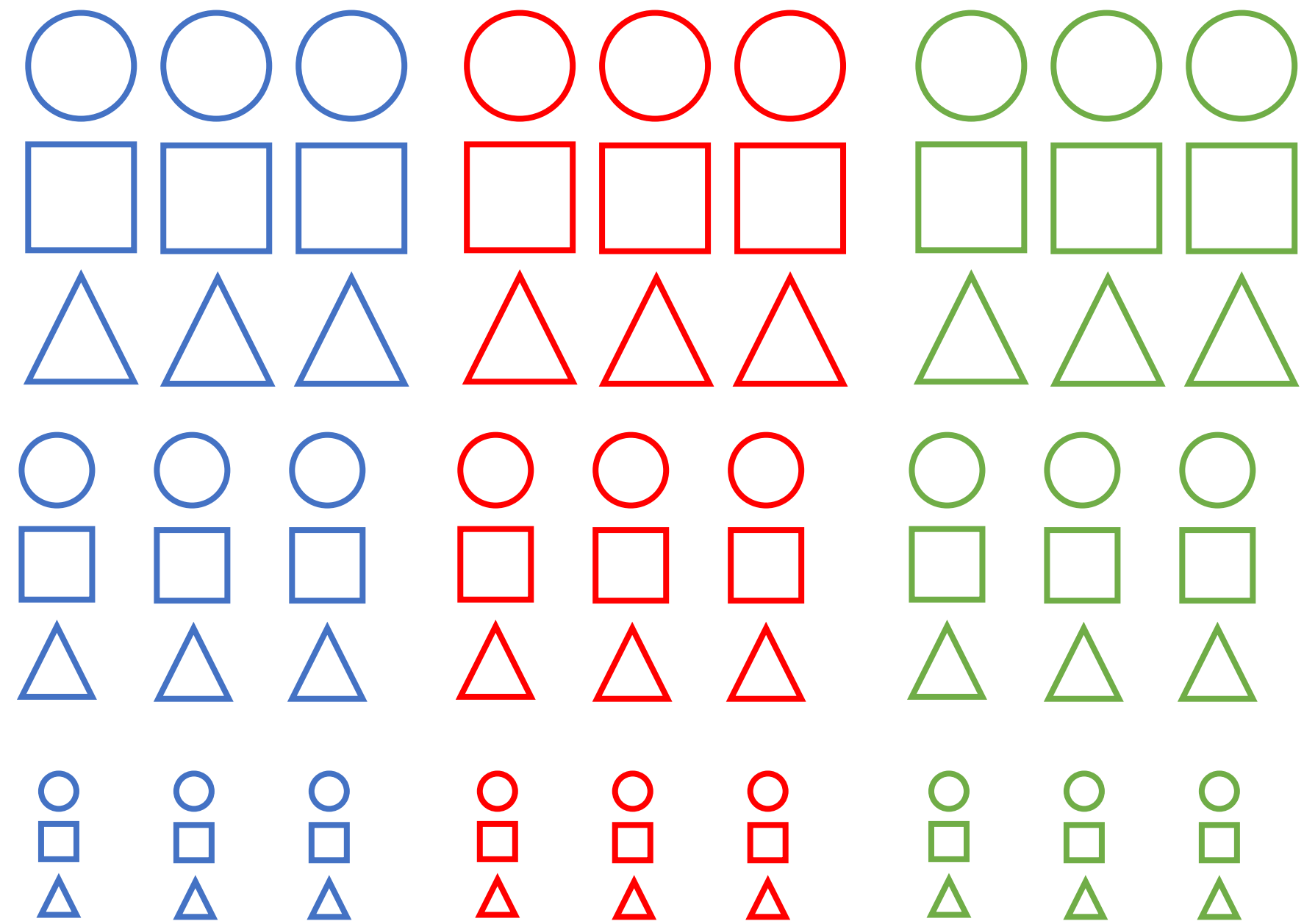


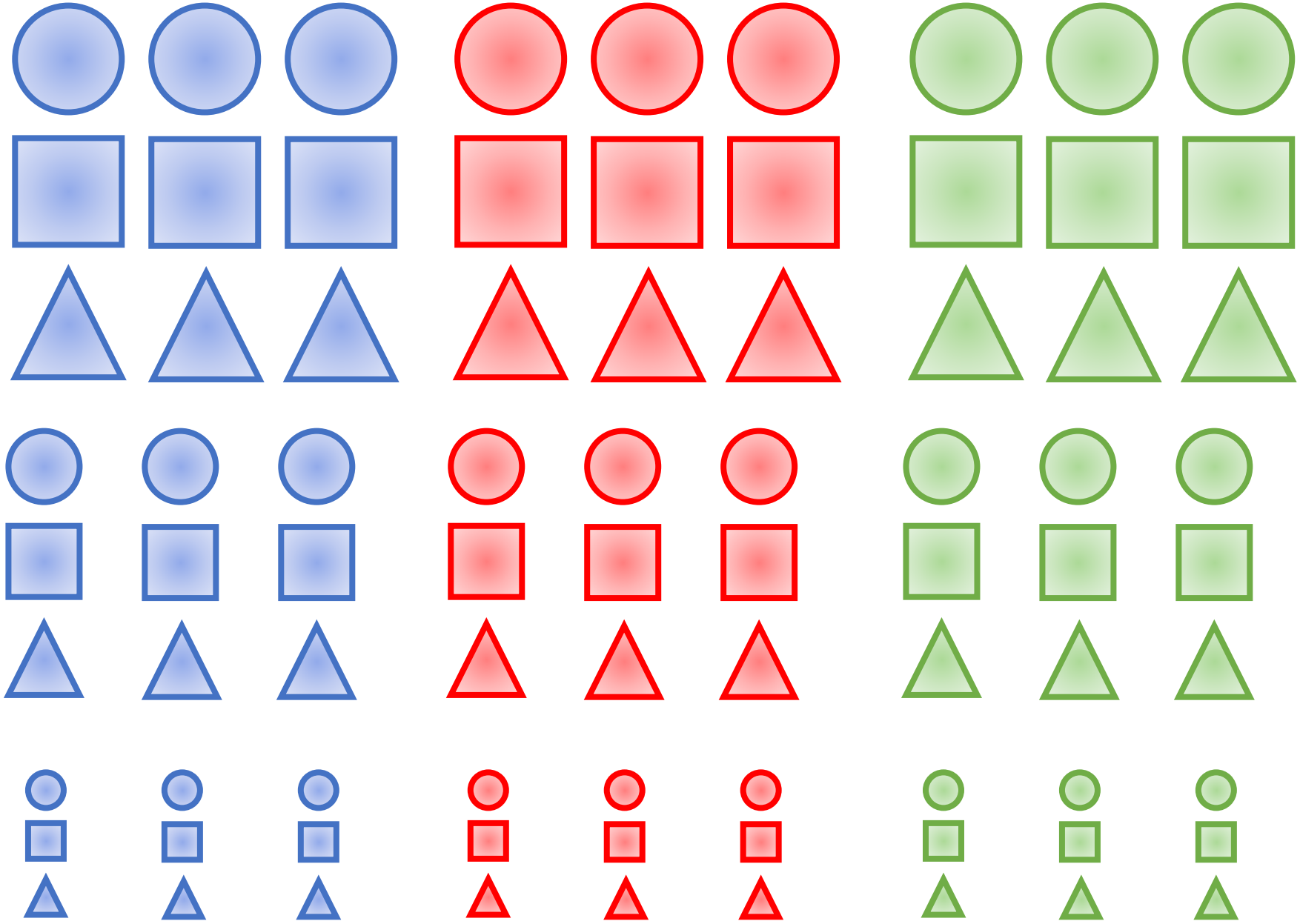
Question 2: Touch another three pictures that are the same in only one way.



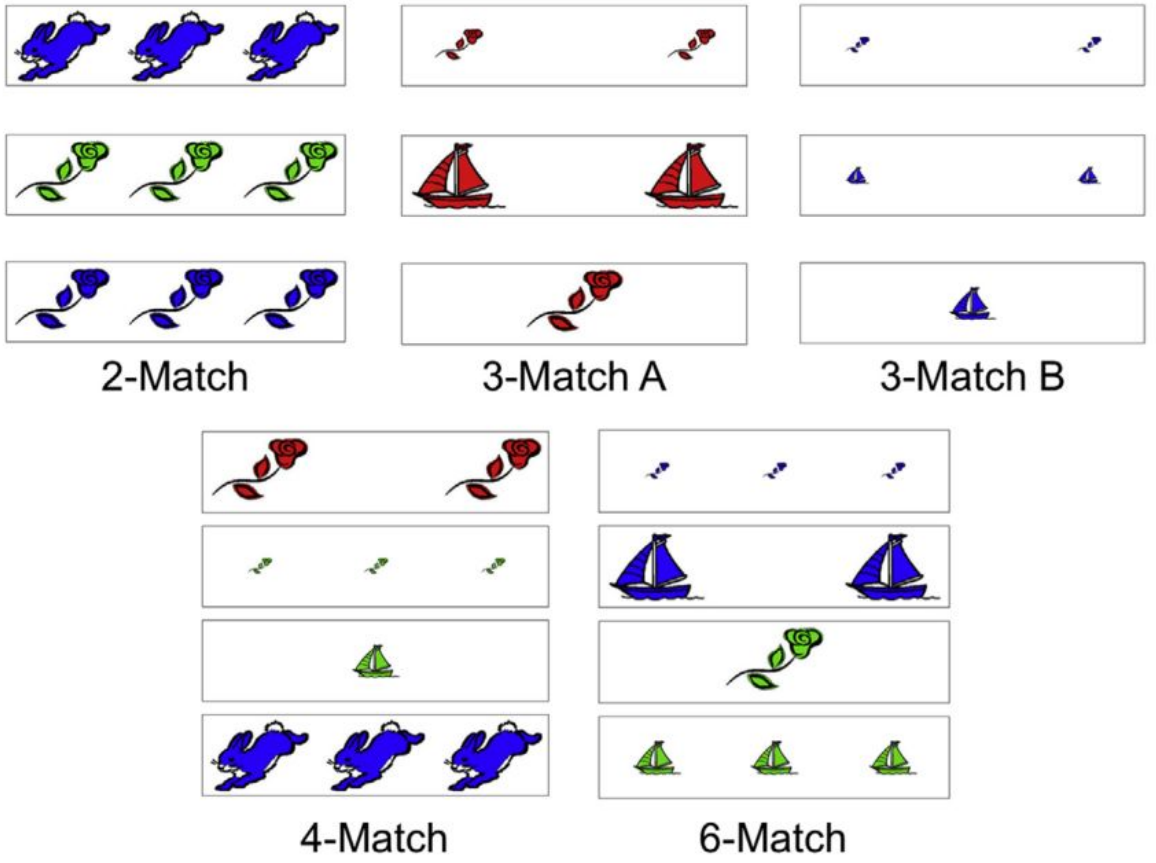
Misc. Stimuli







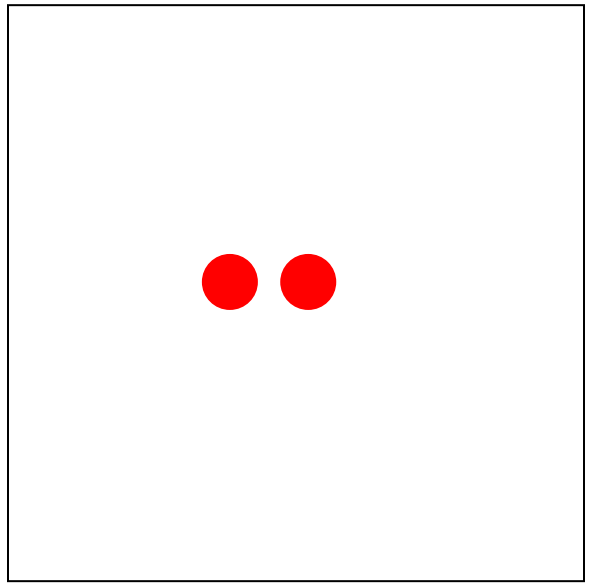
Dick (2014) examples

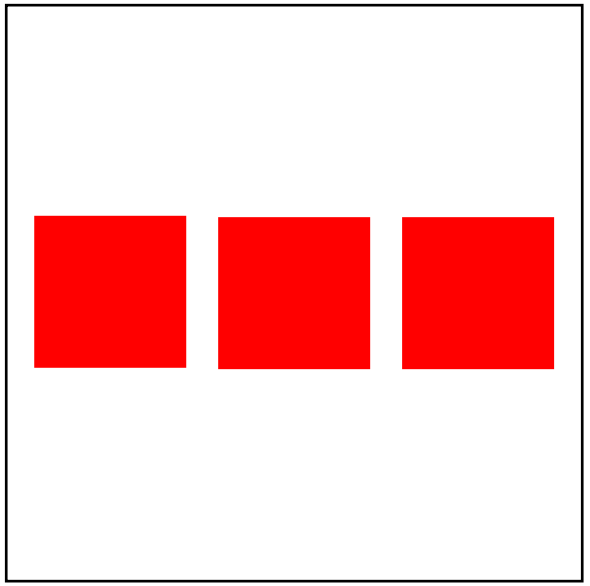


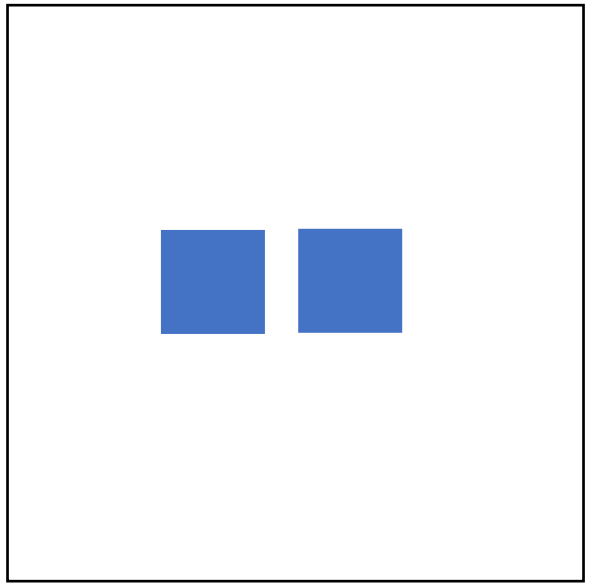
Block 3 (Alternate Version A)

3-Match Version A: All three pairs are a match.

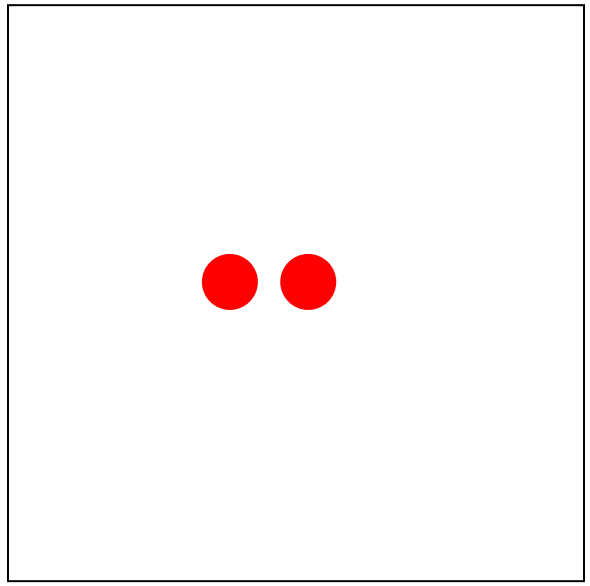
Question 1: Touch two pictures that are the same.

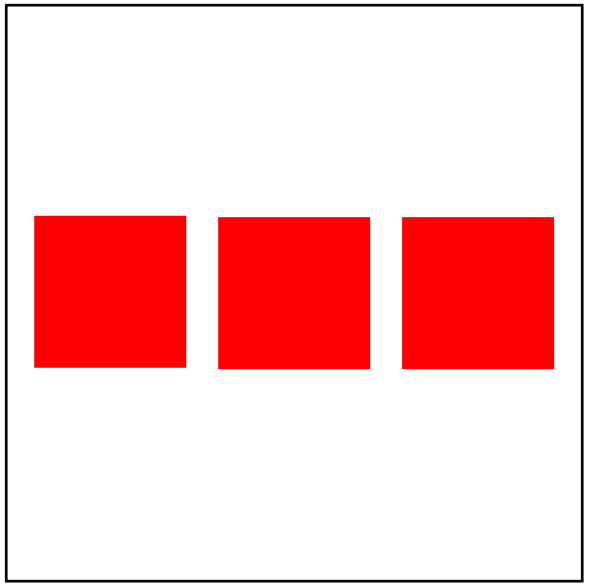


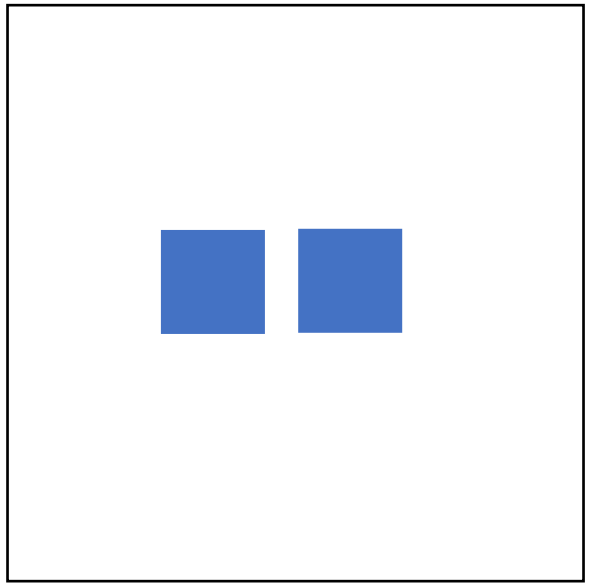




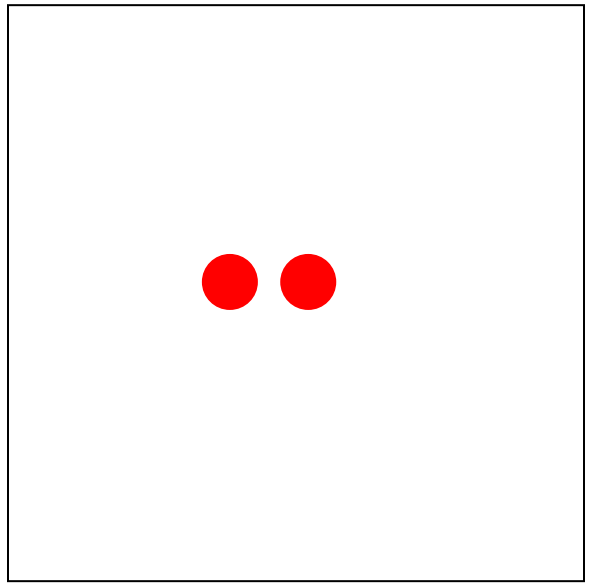
Question 2: Touch two pictures that are the same in a different way.

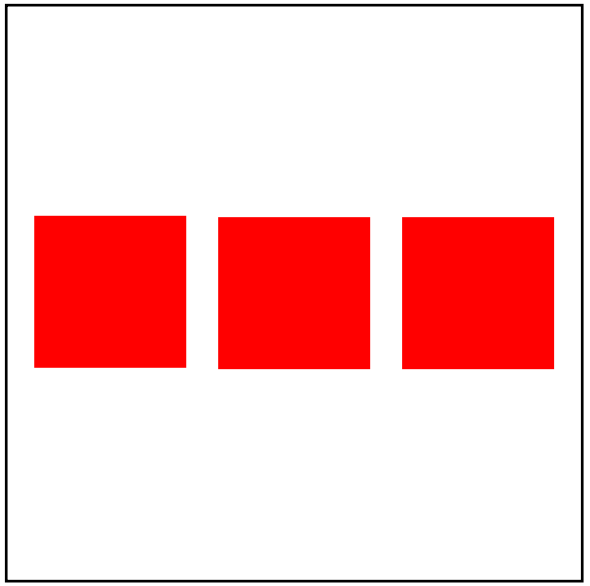


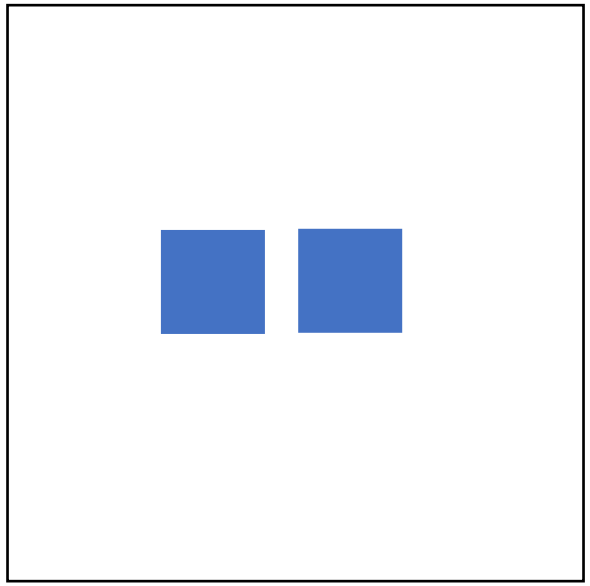




Question 3: Touch two pictures that are the same in a different way.







Example Stimuli

Trial	Card 1	Card 2	Card 3
1	**One** Shape 1 Red **Small**	**One** **Shape 2** Blue Medium	Three **Shape 2** Green **Small**
2	One Shape 1 **Red** **Medium**	**Two** Shape 2 Blue **Medium**	**Two** Shape 3 **Red** Large
3	**Three** Shape 1 Red **Small**	Two Shape 2 **Blue** **Small**	**Three** Shape 3 **Blue** Large
4	One Shape 1 **Red** **Large**	**Three** Shape 2 **Red** Medium	**Three** Shape 3 Green **Large**
5	One **Shape 1** Red Small	Two **Shape 1** Blue **Large**	Three Shape 3 Green **Large**
6	One Shape 1 **Blue** **Small**	**Two** Shape 2 **Blue** Medium	**Two** Shape 3 Green **Small**

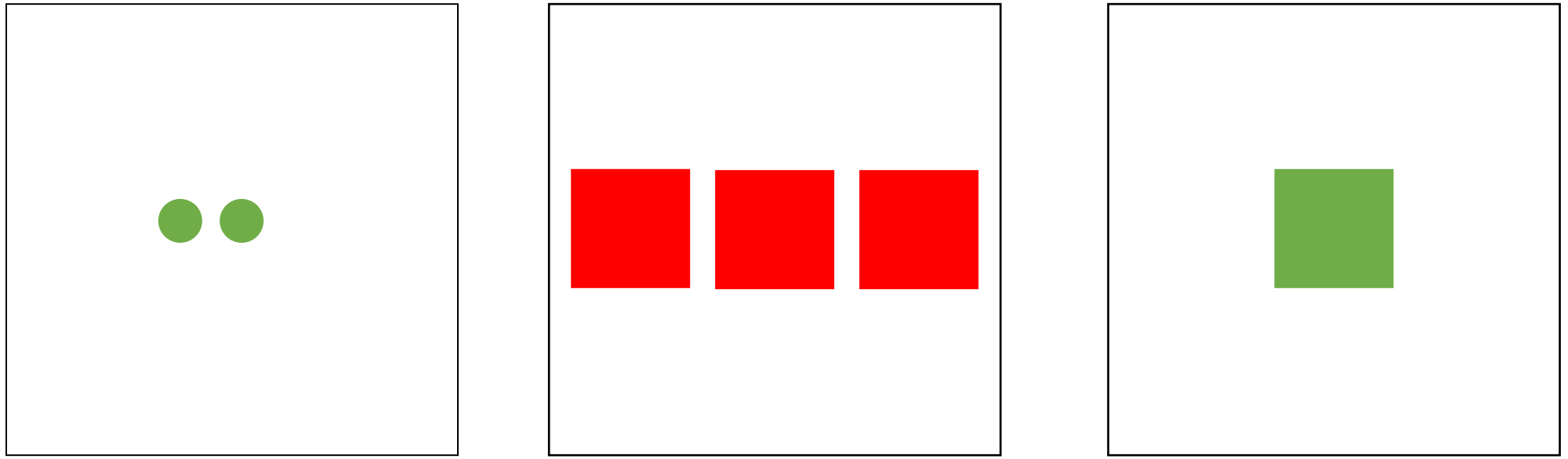
Block 3A Notes

- I (Michael) do not like this version because the only way to get this wrong is to repeat previous answers.

Block 3 (Alternate Version B)

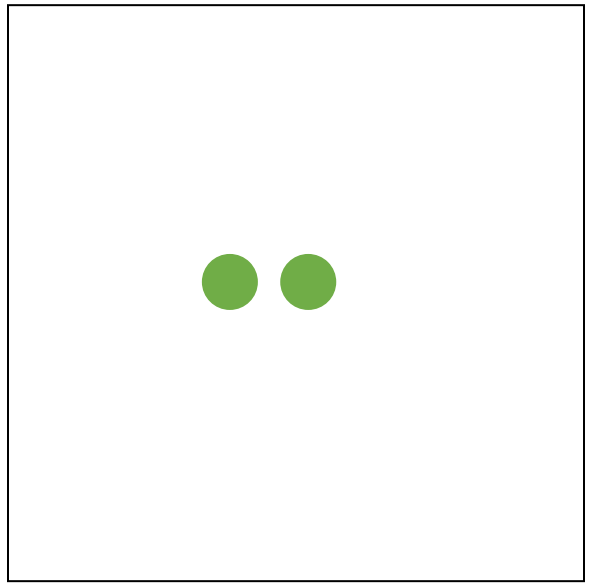
3-Match Version B: One pair is reused because it matches on two different dimensions.

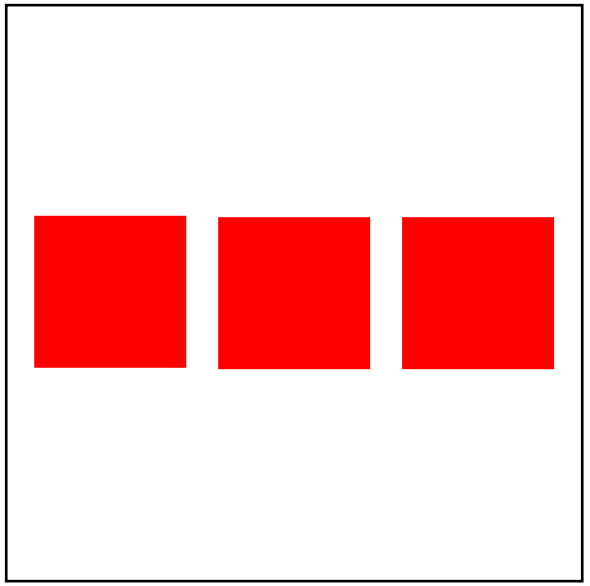
Question 1: Touch two pictures that are the same.

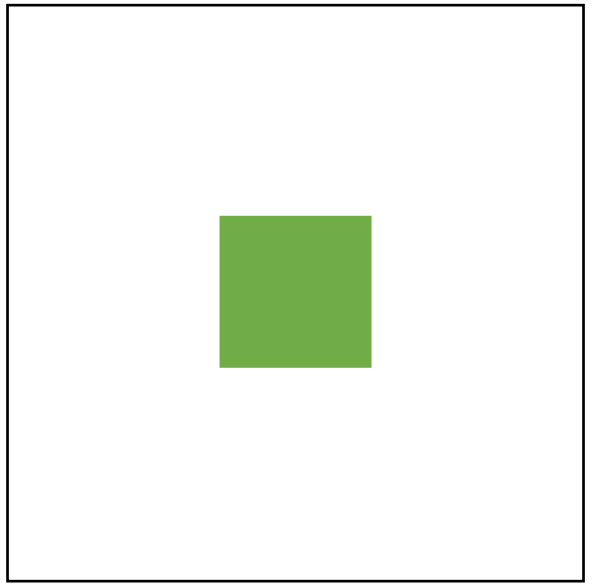


If the previous answer was correct:

Question 2: Touch two pictures that are the same in a different way.

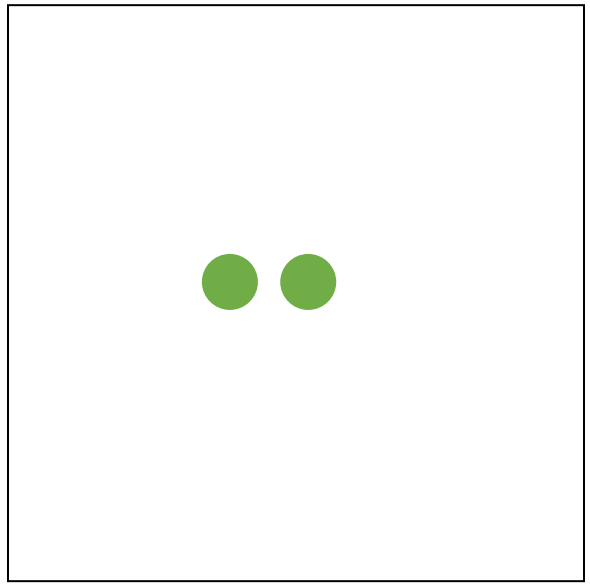


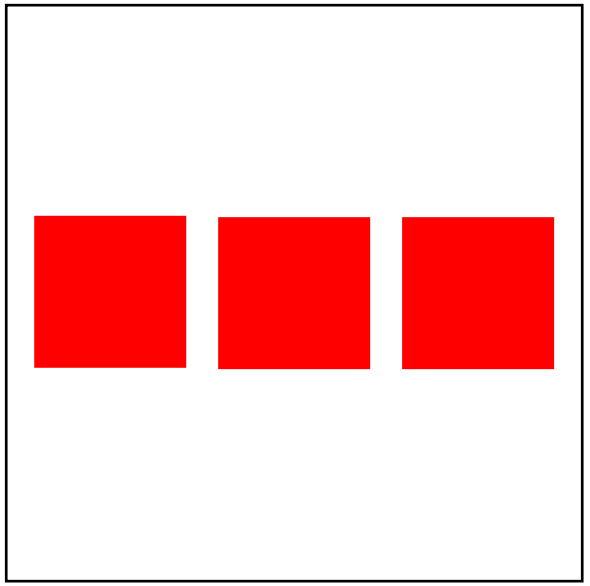


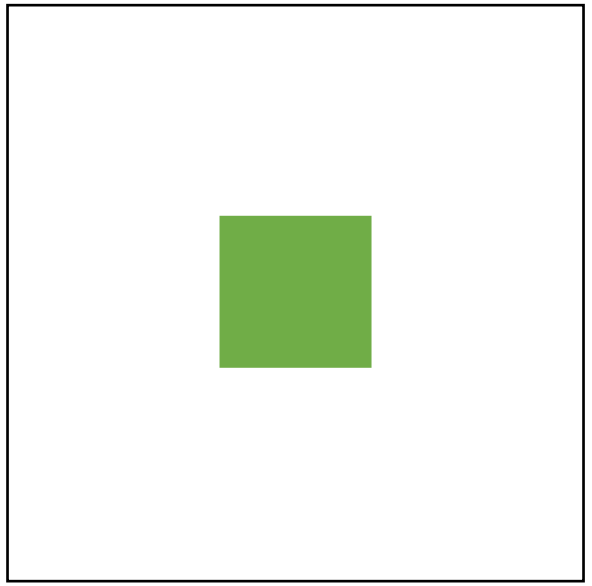


If the previous answer was correct:

Question 3: Touch two pictures that are the same in a different way.







Example Stimuli

Trial	Card 1	Card 2	Card 3
1	**One** Shape 1 Red Small	**One** **Shape 2** **Blue** Medium	Three **Shape 2** **Blue** Large
2	One Shape 1 **Red** **Small**	**Two** Shape 2 Blue Medium	**Two** Shape 3 **Red** **Small**
3	**Two** Shape 1 Red **Small**	**Two** Shape 2 **Blue** **Small**	Three Shape 3 **Blue** Large
4	One Shape 1 **Red** Small	**Three** **Shape 2** **Red** Medium	**Three** **Shape 2** Green Large
5	One **Shape 1** Red Small	Two **Shape 1** **Green** **Large**	Three Shape 3 **Green** **Large**
6	One **Shape 1** **Blue** **Small**	Two **Shape 1** **Blue** Medium	Three Shape 3 Green **Small**