

APTITUDE

# WTMA

## Wiesen Test of Mechanical Aptitude

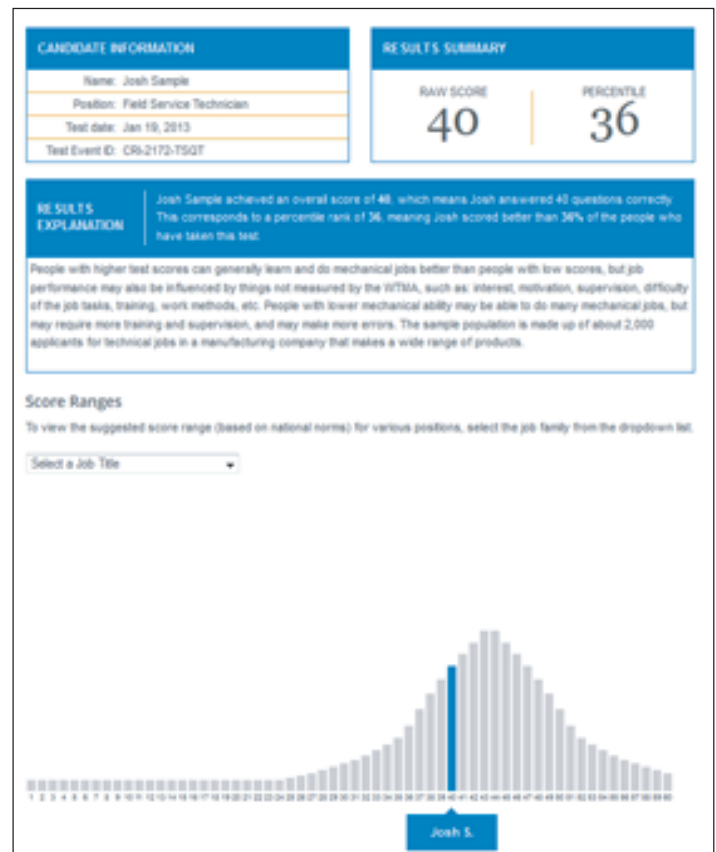
### TEST DESCRIPTION

The WTMA **measures a subject's mechanical aptitude**, or ability to learn to use and maintain equipment and machinery. It is a 30-minute, 60-item test that can predict performance for occupations involving the operation, maintenance, and servicing of tools, equipment and machinery. Such occupations either require or are facilitated by mechanical aptitude. The WTMA was specifically developed to improve upon shortcomings of earlier mechanical aptitude tests. Reading level for the WTMA items is estimated to be at the sixth-grade level, and the WTMA is also available in a Spanish-language version. The WTMA's content is designed to minimize gender and racial/ethnic bias, and it has been shown to have **lower adverse impact than older mechanical aptitude tests**.



### DETAILED SCORE REPORTS

Each individual is given a raw score and a percentile ranking. The raw score indicates how many questions (out of 60) the individual answered correctly, while the percentile ranking is a relative performance metric that indicates how the individual scored in relation to others who have taken the test. For example, a percentile ranking of 45 means that an individual scored better than 45% of the group on which the test was normed.



## VALIDITY INFORMATION

*Construct Validity:* Various studies have shown that the WTMA correlates highly (.70 to .80) with the Bennett Mechanical Comprehension Test (BMCT), the DAT Mechanical Reasoning Test, and other measures of mechanical aptitude and comprehension.

*Adverse Impact:* Four different studies comparing the relative adverse impact of the WTMA and BMCT demonstrate that the WTMA has less adverse impact on women than does the BMCT; the average score difference between men and women across the four studies was 0.31 standard deviation units less for the WTMA than it was for the BMCT.

*Criterion Related Validity:* Research has shown that the WTMA has **predictive validity for jobs which require the operation, maintenance, or repair of machinery or mechanical equipment**. In a validity study of the WTMA involving 96 carpet manufacturing operators, the validity coefficient was .24 ( $p < .05$ ), using supervisors' evaluations of productivity as the criterion. Productivity was evaluated using a 20-item performance rating instrument. The validity coefficient for the WTMA was higher than the validity of any of the other four cognitive aptitude tests used in the study.

## STANDARDIZATION SAMPLE

Norms for the WTMA were established by administering the WTMA to a sample of 1,817 adults aged 18 and older working in industrial occupations. This sample included employees at a utility company, machine operators for a textile manufacturer, custodial workers of a public transportation organization, production workers at a diesel engine manufacturer, maintenance workers for a school district, electricians, and other industrial workers. Using this sample, it was determined that the WTMA has very high reliability (.97).

## MEAN SCORES AND STANDARD DEVIATIONS FOR VARIOUS INDUSTRIAL SAMPLES

Type of Sample	N	M	SD
Applicants for Cleaner/Serviceperson at a public bus and rail transportation agency	161	39.5	6.62
Applicants for Repairperson at a public bus and rail transportation agency	27	42.6	7.25
Applicants for Communications/Signalperson at a public bus and transportation agency	40	41.3	8.10
Candidates for promotion to skilled trades apprentice (electrician, machine repair, etc.) from manufacturing jobs (assembly line or other production machine operation) at a diesel engine manufacturer	123	47.6	4.27
Incumbent tufting machine operators/maintainers in a carpet factory	102	36.3	7.88
Incumbents in technical/mechanical jobs in a public utility company	76	45.5	5.65
Incumbents in nontechnical/nonmechanical (clerical) jobs in a public utility company	93	44.0	5.91
Applicants for maintenance worker in a large school district	909	41.5	5.79
Applicants for production worker at a diesel engine manufacturer	258	44.2	5.69
Total industrial sample (including all of the above and some smaller samples)	1,817	41.8	6.42

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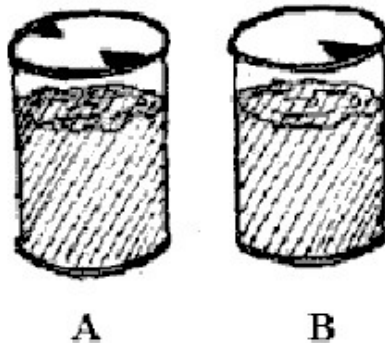
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## WTMA Sample Questions

This test asks questions about everyday objects, things you might find in the kitchen or in other places in the home, or as you go about your everyday life. None of these sample questions are from the test.

### Sample Questions

#### Sample Question

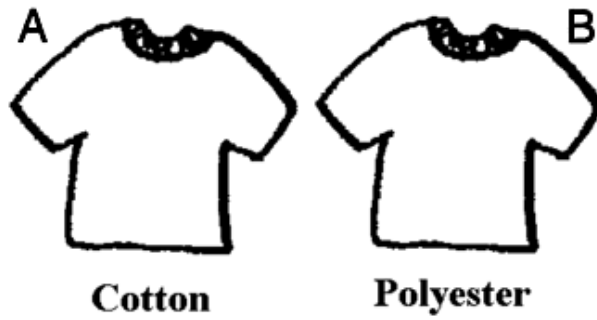


Look at this drawing of two cans of juice. Which will pour more easily?

- (A) Can A
- (B) Can B
- (C) No difference

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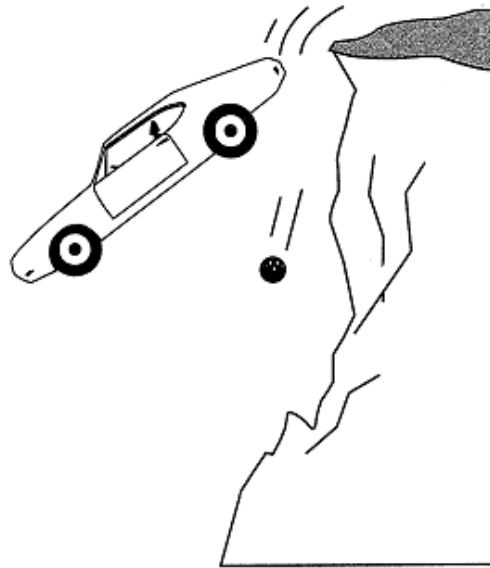
## Sample Question



Which of these new shirts is more likely to shrink if washed in hot water?

- (A) A
- (B) B
- (C) Can't tell

## Sample Question



If a car and a bowling ball were thrown off a 100 foot cliff at the same time, which would hit the ground first?

- (A) Car
- (B) Ball
- (C) No difference

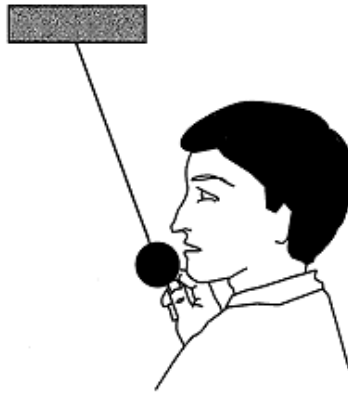
## Sample Question



If a cannon fires a cannonball horizontally and you drop a cannonball at the same time, which will hit the ground first?

- (A) Drop
- (B) Fire
- (C) No difference

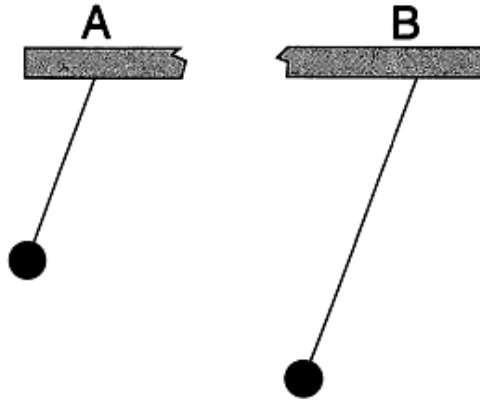
## Sample Question



You tie a string to the ceiling and attach a weight to the end. You hold the weight next to your face but not touching it and then let go. The weight swings down and away from you and then starts swinging back toward you. If you do not move, will it hit you?

- (A) Yes
- (B) No
- (C) Can't tell

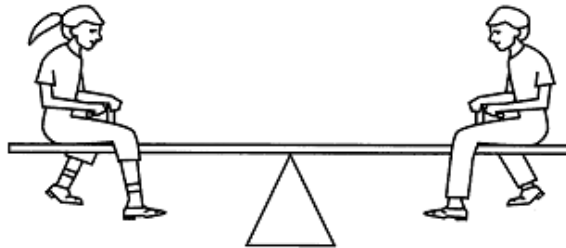
## Sample Question



You put the same amount of weight at the end of these two pendulums. If you let go of the two pendulums at the same time, which will swing back and forth more times in a minute?

- (A) A
- (B) B
- (C) No difference

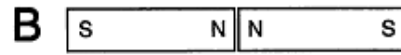
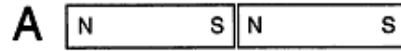
## Sample Question



These children weigh the same. Will this seesaw balance?

- (A) Yes
- (B) No
- (C) Can't tell

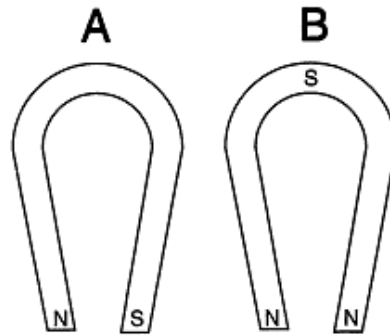
Sample Question



Which of these pairs of magnets will stick together in the positions they are in?

- (A) Drawing A
- (B) Drawing B
- (C) Both Drawings

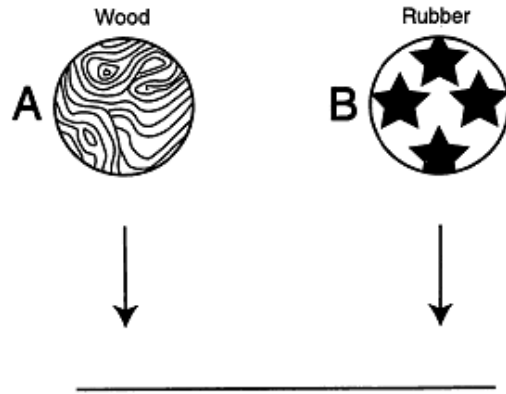
Sample Question



Which of these show how the poles are arranged on horseshoe magnets?

- (A) Drawing A
- (B) Drawing B
- (C) Neither

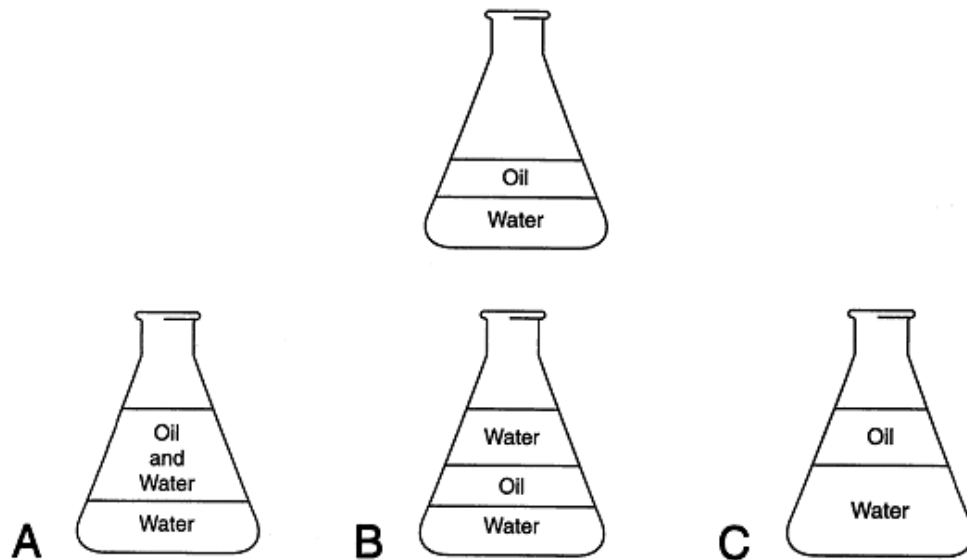
Sample Question



Which ball would bounce higher if dropped from the same height?

- (A) Ball A
- (B) Ball B
- (C) No difference

Sample Question



At the top is a drawing of a glass container holding water and oil. If you add more water what would it look like?

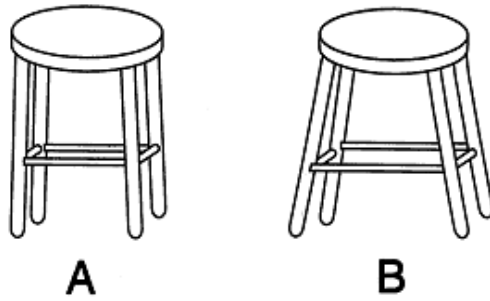
- (A) A



(B) B

(C) C

Sample Question



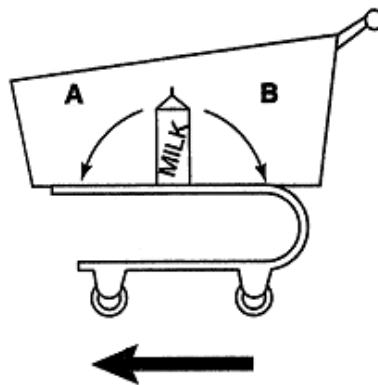
These stools are the same height. Which is more likely to tip over when an active child sits on it?

(A) Stool A

(B) Stool B

(C) No difference

Sample Question



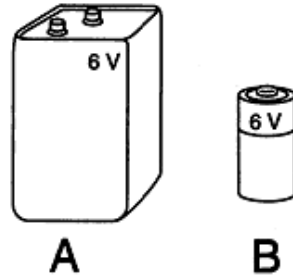
If the shopping cart was moving in the direction of the big arrow and then you stopped it suddenly, which way would the milk carton fall?

(A) A

(B) B

(C) Can't tell

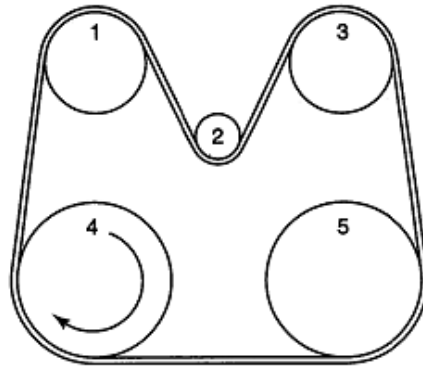
Sample Question



Which battery has the higher voltage?

- (A) Battery A
- (B) Battery B
- (C) There's no difference

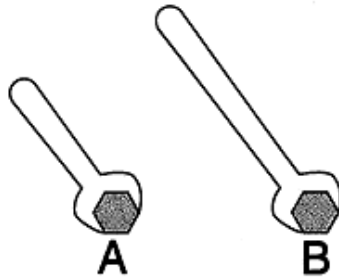
Sample Question



Which wheels are turning in the same direction as wheel 4?

- (A) 1, 2, and 3
- (B) 1, 2, and 5
- (C) 1, 3, and 5

## Sample Question



Which wrench will make it easier to tighten the bolt?

- (A) A
- (B) B
- (C) There's no difference

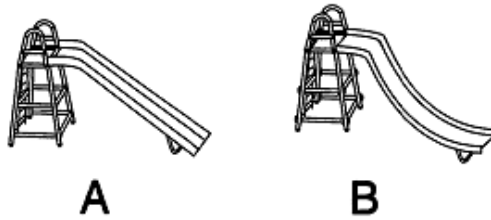
## Sample Question



Lightning strikes at one end of a city. You are at the other end of the city. Would you hear the thunder or see the lightning first?

- (A) Hear the thunder
- (B) See the lightning
- (C) You will hear and see at the same time

## Sample Question



Which slide will give the faster ride?

- (A) A
- (B) B
- (C) There's no difference

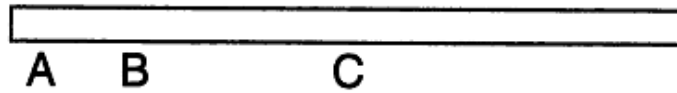
## Sample Question



Will this bulb light up?

- (A) Yes
- (B) No
- (C) Can't tell

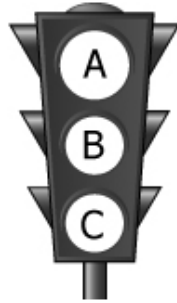
## Sample Question



You want to lift this pole off the ground and carry it using one hand. Where should you pick it up to be able to carry it most easily?

- (A) A
- (B) B
- (C) C

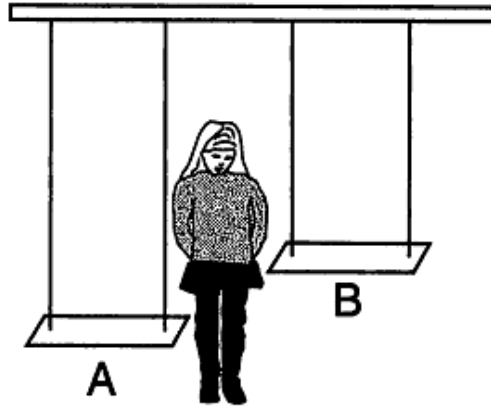
## Sample Question



In this typical traffic signal, which light is the red one?

- (A) A
- (B) B
- (C) C

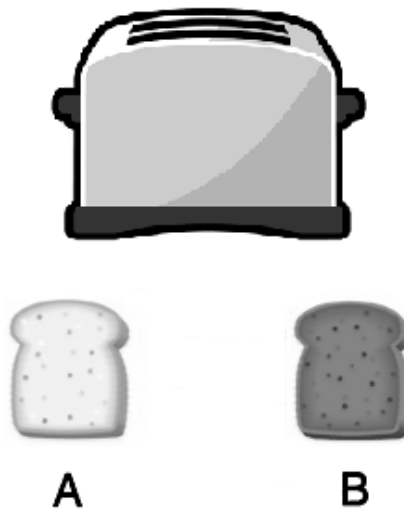
Sample Question



The girl wants to swing fast. After she gets up to full speed, on which swing will she cover more distance in 1 minute?

- (A) A
- (B) B
- (C) No difference

Sample Question



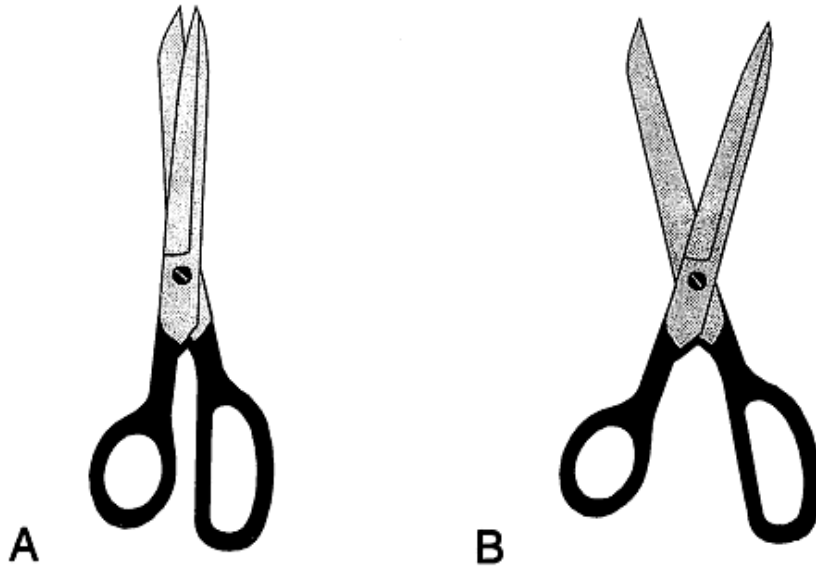
You start with two slices of bread that are exactly the same. You toast slice B. Which slice weighs more now?

- (A) A

(B) B

(C) There is no difference

Sample Question



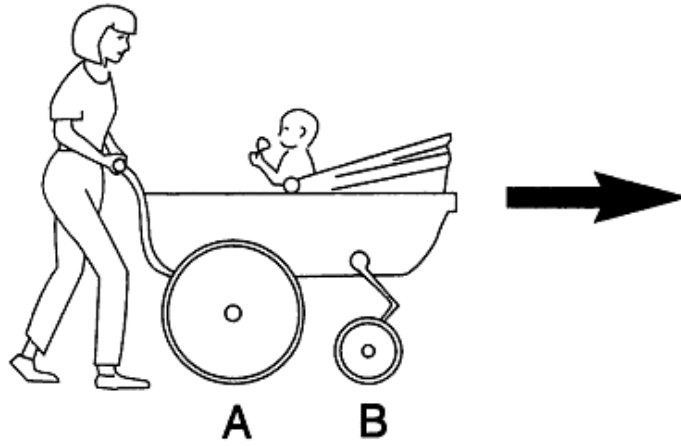
How far should you open the scissors so it is easier to cut a piece of cardboard?

(A) A

(B) B

(C) There is no difference

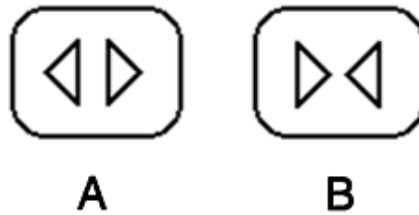
Sample Question



Which wheel is turning faster?

- (A) A
- (B) B
- (C) No difference

Sample Question

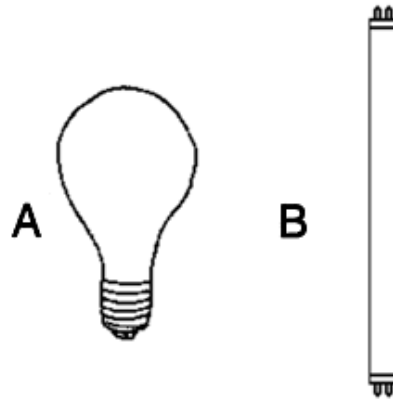


Which button should you push to close the doors of an elevator?

- (A) A
- (B) B
- (C) Can't tell



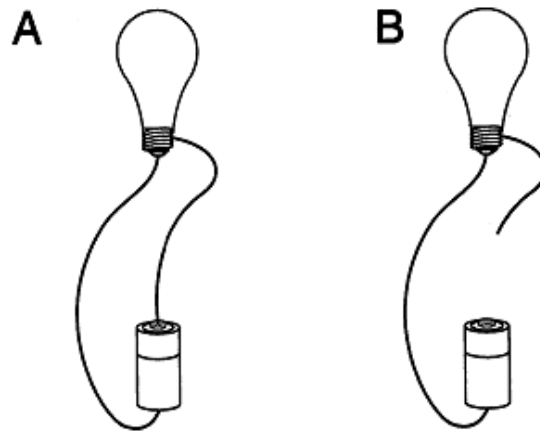
Sample Question



Which light bulb gets hotter?

- (A) A
- (B) B
- (C) Can't tell

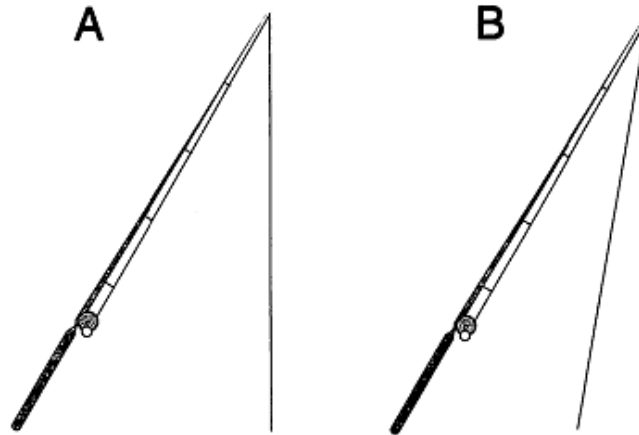
Sample Question



Which bulb will light up?

- (A) Drawing A
- (B) Drawing B
- (C) Both

Sample Question



- Which way will the fishing line hang when the fishing rod is tilted?
- (A) Drawing A
  - (B) Drawing B
  - (C) Either

Sample Question



- Which stick is easier to balance on the palm of your hand?
- (A) Stick A

(B) Stick B

(C) No difference

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62 Candlewood Road • Scarsdale, NY 10583 • Tel.: 617.244.7405 • [Info@APRTestingServices.com](mailto:Info@APRTestingServices.com)  
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