



# DIY Air Force Activities:

## Reaction Time



### Materials:

- calculator
- ruler or meter stick
- 2 people: A *Tester*, and a *Subject*. Take turns at each job!

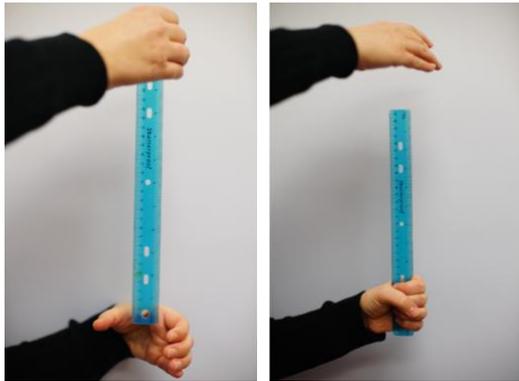
Do you have cat-like reflexes? Cats are known to have very fast reaction times. Your reaction time measures how quickly you can respond to a stimulus or input. The input travels from your brain, where it is processed, to the muscle you need to react! In this experiment you will test how quickly you can respond to different types of sensory input.

**Directions:** For each test the *Subject* will dangle their hand off the edge of a table. The *Tester* will hold the top of the ruler between two fingers with the 0 mark at the subject's index finger (see additional instructions on back of page). Record the measurement (cm) where the *Subject* caught the ruler. You can then use the formula below to calculate your reaction time. Gather the results of three trials and then average. Experiment with your dominant and non-dominant hand!

Visual Test: When the *Subject* SEES the *Tester* release the ruler they must grab it as fast as possible.

Auditory Test: The *Subject* closes their eyes and the *Tester* SAYS "release" as they let go of the ruler.

Tactile Test: The *Tester* TOUCHES the *Subject* on the shoulder as the ruler is released. No peeking!



The average reaction time for humans is 0.25 seconds to a visual stimulus, 0.17 for an auditory stimulus, and 0.15 seconds for a tactile stimulus.

	Visual		Auditory		Tactile	
	cm	time (s)	cm	time (s)	cm	time (s)
Trial 1						
Trial 2						
Trial 3						
Average						

$$time (t) = \sqrt{\frac{2y}{g}}$$

y= the distance you measure in cm  
g= gravity = 980 cm/s<sup>2</sup>

If this math looks too scary feel free to have another friend time you with a stopwatch!

### Air Force Associations:

Air Force pilots undergo rigorous training to hone their reaction times. Quick reaction times are necessary because pilots need to concern themselves with not only visual inspection of their environment, but also be able to scan their instrument panel to be aware of any equipment situations requiring their attention. It has been shown that reaction time tests can predict with over 90% accuracy whether you have the reaction time of a pilot.





1. *Tester* should hold ruler above *Subject's* open hand.

2. Make sure the zero mark is right above the *Subject's* pointer finger.

3. *Tester* drops ruler and *Subject* catches it!

4. Read ruler above *Subject's* pointer finger to calculate distance.