Reaction

Reaction timer

http://www.topendsports.com/testing/reactionmake.htm

Reaction time is the ability to respond quickly to a stimulus.

- It is important in many sports and day to day activities, though it is not often measured.
- Simple reaction time is the time taken between a stimulus and movement e.g., sprint start. Such simple reaction time depends on nerve connections and signal pathways, is 'hard wired' in your body composition and cannot be improved.

Choice reaction time is taken between stimulus and action which requires a choice.

Choice reaction time can be improved by practice and training. Performers receive stimuli from:

- the eyes (position of other players, the ball etc),
- the ears (calling from players, the referee, even spectators), and
- kinesthetic sense (the performer's position, their options etc).

Skilled players reduce reaction time:

- by selecting the most important information, and
- by anticipating other players actions and the path of the ball quickly.

Testing Reaction Time

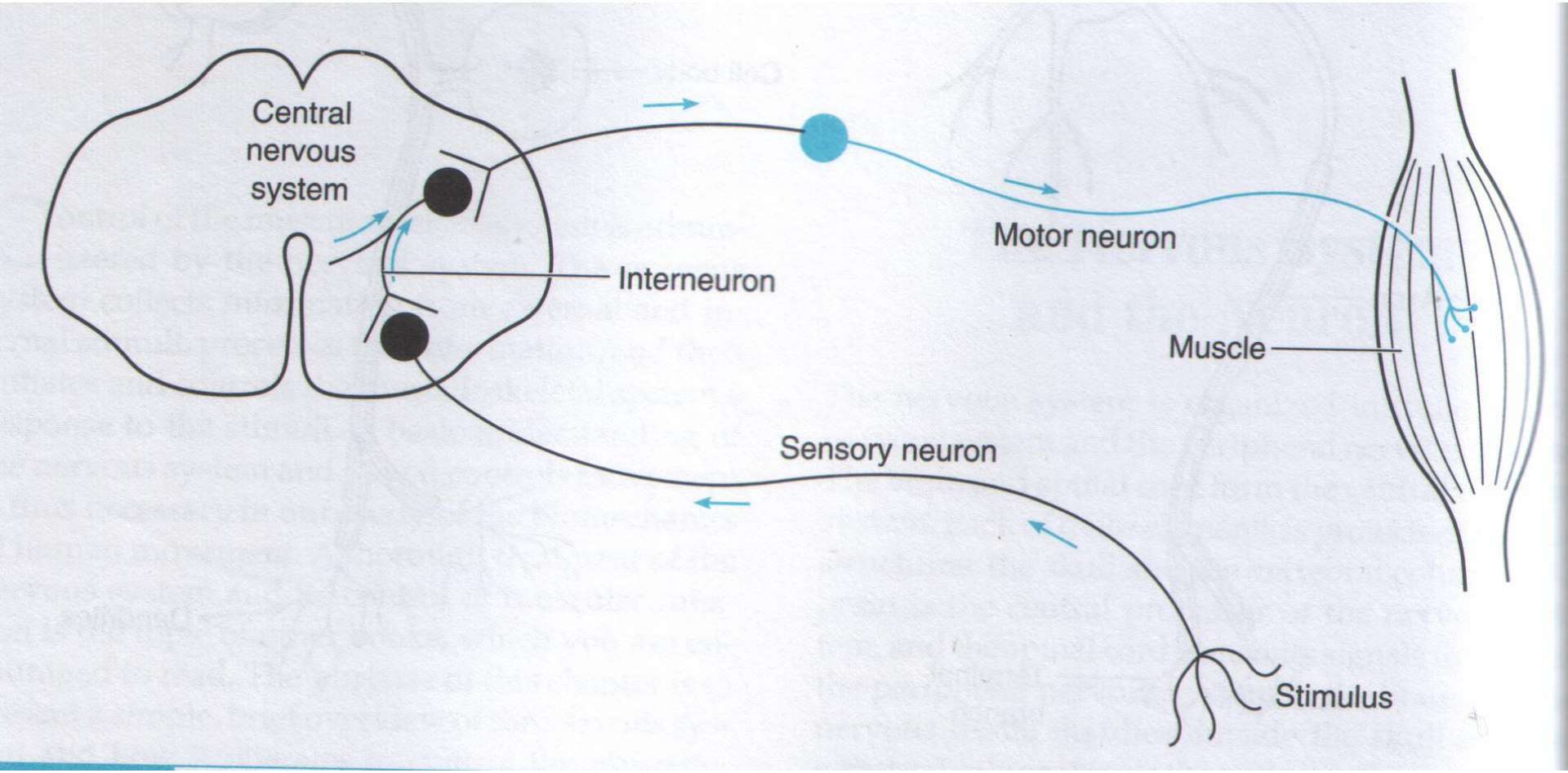
- As with all sports fitness testing, specificity is very important, and if you were to seriously want to measure an athlete's reaction time in a certain sport, you would want a test that is more specific to the visual cues and muscle reactions that are encountered during that sport.

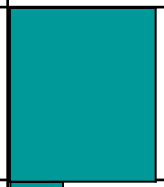
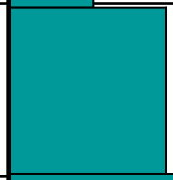
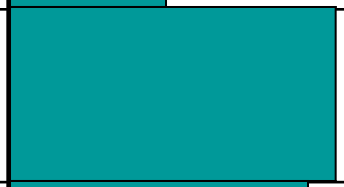
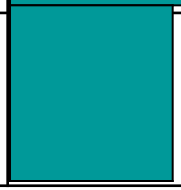
What is it measuring?

When you see the screen color change:

- the signal for the change in color travels from your eye along the optic nerve to be registered in your brain, from which
- a message is sent to another part of your brain that controls your muscles;
- your brain must then send a signal along the nerves to your muscles, telling them to depress the mouse button;
- signals travel fast along each of the nerve pathways required;
- the majority of the reaction time is taken up at the junction points between the different nerves involved, and
- between the nerves and the muscles at your fingers.

Schematic diagram of the pathway of a neural impulse from external stimulus to muscle action



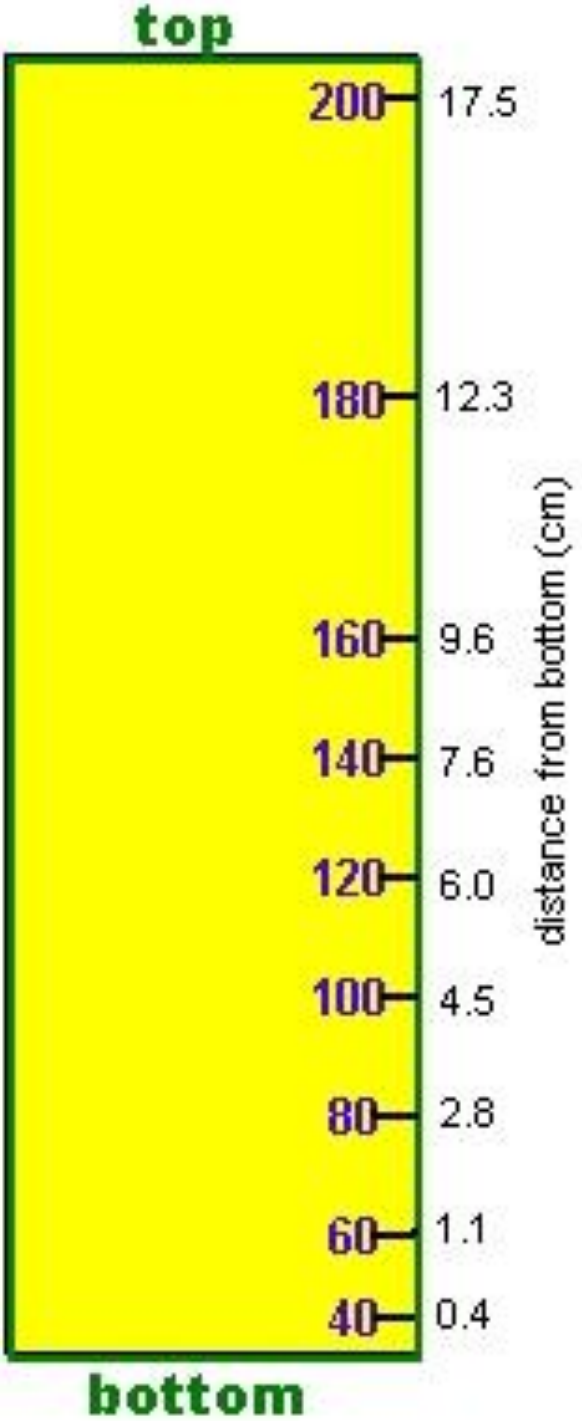
Time, s	n	%	Histo-gram	Time, s	n	%	Histo-gram
0 - 0.05	1779	10		0.35-0.40	1003	6	
0.05 - 0.10	556	3		0.40-0.45	421	2	
0.10 - 0.15	775	4		0.45-0.50	192	1	
0.15 - 0.20	1922	11		0.50-0.60	149	1	
0.20 - 0.25	4479	25		0.60-0.70	97	1	
0.25-0.30	4072	23		> 0.70	249	1	
0.30-0.35	2298	13		Sum	17992	100	

An example of the time reaction test

The basic idea of the test is to calculate the time of reaction using a distance that a piece of thick cardboard falls down.

$$t = \sqrt{\frac{2s}{g}}$$

- t is time;
- s is distance;
- g is gravitation constant



Equipment Required:

- a piece of thick paper or cardboard, approximately 20 cm long;
- a ruler, a pen or pencil.

Construction Method:

- Mark the piece of paper or cardboard.
- The numbers 40 to 200 (time in milliseconds) are to be written on the card at the specified distances from the bottom of the card.

Note: all measurements are approximate

Distance – Time data

s, cm	t, ms	s, cm	t, ms
1	45	11	150
2	64	12	156
3	78	13	163
4	90	14	169
5	101	15	175
6	111	16	181
7	119	17	186
8	128	18	192
9	135	19	197
10	143	20	202

Test Method

- **Have a friend hold the reaction timer at the top.**
- **Line up your fingers with the bottom edge of the reaction timer.**
- **Have the friend drop the reaction timer at any time, without warning, and try and grab it between your fingers.**
- **Don't chase it, that's cheating!**
- **Read off your score from the side.**

Scoring of the test results

Time (ms)	*Rating*
40	Pretty good.
60	A little below average.
80	Slow.
100	Very slow.
120	Have another go.
140	I wouldn't get into a car with you.
160	What drugs are you on?
180	Hello?
200	Wake up!