



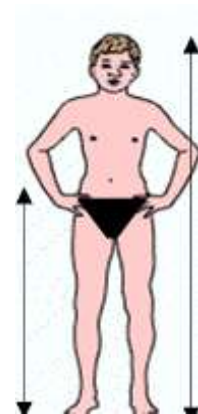
## Are You Golden?

Investigate the relationship between a person's height and the distance from their tummy button to the floor.

Either use data collected from your class or the [PHIDATA.xls](#) dataset available from the *CensusAtSchool* website (reproduced on page 2)

Remember this data is real data entered into our online questionnaires so you will need to keep a look out for any 'dodgy data' or outliers.

You may want to work out some averages, such as the **mean**, **median** and **mode** of the data. Or plot a scatter graph of tummy button height against height or a box plots to compare male with female.



### ...What have you discovered?

The ratio  $\frac{\text{height}}{\text{tummy button height}}$  is known as phi  $\phi$ .

This is often called the Golden Ratio and is approximately 1.62.

It appears in many things such as plants, DNA, the solar system, art and architecture and even the bible!

### Who is the most golden human being in your class?

**Extension** – You can also use the **trimmed mean** of the data.

This means you trim off the most extreme values and find the mean of the rest. Usually a value of 95% or 0.95 is used. This excludes 2.5 % of the most extreme small values and 2.5 % of the most extreme large values. Investigate what happens if you reduce this to 90%, 75% ... of the values. (A separate [help sheet](#) to do this in Excel is available.)

A useful website to explore that more information about the Golden Ratio is <http://goldennumber.net>



# Are You Golden?

## Data:

Region	Gender F or M	Age years	Height cm	TummyButt on cm	FootLengt h cm	WristCirc mm	ThumbCirc mm	Phi
West Midlands	F	13	153	97	23	160	50	
South	F	13	161	98	22.5	150	53	
South	M	12	160	80	32	150	60	
South East	F	13	160	92	24	155	62	
North West	F	14	171	103	23	150	60	
South East	F	14	160	99	23	160	80	
East Midlands	F	13	90	50	32	120	20	
North West	F	13	148	100	22	135	60	
West Midlands	M	14	151	97	24	150	50	
East Midlands	F	13	165	135	27	180	65	
South East	M	13	200	50	23	190	23	
East Midlands	F	14	159	93	23	136	53	
West Midlands	F	13	120	70	24	129	47	
North West	F	13	160	102	22	150	50	
South	M	11	152	90	22	160	40.5	
South	M	12	150	103	19	170	50	
South	M	11	140	134	14.6	138	58	
South East	F	13	170	102	23	140	60	
North West	F	13	168	105	23	170	60	
London	M	13	154	96	22	150	60	
London	M	13	155	96	24.7	156	62	
West Midlands	F	13	145	94	24	150	54	
London	M	13	168	102	29	140	20	
London	M	14	168	104	24.5	164	63	
Home Counties	M	14	158	95	24	150	60	
South	F	12	143	88	20	150	50	
South East	F	14	160	95	30	140	50	
East Midlands	F	12	150	95	22	150	60	
South West	F	13	164	101	25	145	70	
North West	M	13	161	102	25	160	70	
South	M	13	166	103	25	180	50	
South West	F	15	90	98	28	198	45	
North West	M	13	156	93	24	170	65	
East	M	13	157	51	19.2	152	60.1	
South East	F	13	150	98	28	200	60	
North West	F	11	167	85	26	180	60	
North West	F	12	164	103	22	150	60	
East	F	11	151	96	22	145	65	
South	M	12	149	98	29	170	65	
North East	M	13	173	108	23.5	167	80	
London	M	13	155	96	21	120	22	
South	M	12	149	94	27.5	160	58	
North West	M	11	141	83.5	21	150	50	
South	F	13	150	100	23.5	120	30	
East Midlands	F	13	159	92	23	160	70	
East	M	13	164	97	26	170	55	
North Wales	F	13	154	96	22	148	60	
East Midlands	F	13	164	98	27.7	165	60	
South	F	13	153	96	21	130	50	
North West	F	11	147	90	23	150	60	