



**nrich**

Specialists in rich mathematics

# Harmonic Triangles

Can you see what the rules for making the next line are?

$$\frac{1}{1}$$

$$\frac{1}{2} \quad \frac{1}{2}$$

$$\frac{1}{3} \quad \frac{1}{6} \quad \frac{1}{3}$$

Can you work out the next two rows?

$$\frac{1}{4} \quad \frac{1}{12} \quad \frac{1}{12} \quad \frac{1}{4}$$

$$\frac{1}{5} \quad \frac{1}{20} \quad \frac{1}{30} \quad \frac{1}{20} \quad \frac{1}{5}$$

$$\frac{1}{6} \quad \frac{1}{30} \quad \frac{1}{60} \quad \frac{1}{60} \quad \frac{1}{30} \quad \frac{1}{6}$$

Will the second diagonal  
( $1/2, 1/6, 1/12 \dots$ ) always contain unit fractions?

Can you prove it?

Thousands more problems can be found on the NRICH Maths website:

[www.nr rich.maths.org](http://www.nr rich.maths.org)