

# Hole in the Bucket

## Solution

$1 \text{ cm}^3 = 1 \text{ ml}$	$1 \text{ m}^3 = 1000 \text{ litres}$
<b>Capacity of pool in <math>\text{cm}^3/\text{m}^3</math></b>	
$120 \text{ cm} \times 100 \text{ cm} \times 40 \text{ cm} = 480\,000 \text{ cm}^3$	$1.2 \text{ m} \times 1 \text{ m} \times 0.4 \text{ m} = 0.48 \text{ m}^3$
<b>Capacity of pool ml/litres</b>	
$480\,000 \text{ cm}^3 = 480\,000 \text{ ml}$	$0.48 \text{ m}^3 \times 1000 = 480 \text{ litres}$
$480\,000 \text{ ml} \div 1000 = 480 \text{ litres}$	
<b><math>\frac{3}{4}</math> full</b>	
$480\,000 \text{ ml} \times \frac{3}{4} = 360\,000 \text{ ml}$	$480 \text{ litres} \times \frac{3}{4} = 360 \text{ litres}$
$360\,000 \text{ ml} \div 1000 = 360 \text{ litres}$	
<b>Leak from full bucket per trip to the paddling pool</b>	
$150 \text{ ml} \times 10 = 1500 \text{ ml}$	$0.15 \text{ litres} \times 10 = 1.5 \text{ litres}$
<b>Water in bucket when Liza gets to the paddling pool</b>	
$12\,000 \text{ ml} - 1500 \text{ ml} = 10\,500 \text{ ml}$	$12 \text{ litres} - 1.5 \text{ litres} = 10.5 \text{ litres}$
$10\,500 \text{ ml} \div 1000 = 10.5 \text{ litres}$	
<b>Number of buckets needed</b>	
$360\,000 \text{ ml} \div 10\,500 \text{ ml} \approx 34.29$	$360 \text{ litres} \div 10.5 \text{ litres} \approx 34.29$

Liza will need to fill the bucket 35 times. This will ensure the pool is at least three-quarters full.

