

Back to the story ...

You are sent out of the cave next. You find a third species of alien monster. It is not drooling, but it does have a serious breath problem. You find that this species is 2 cm tall at birth and gets five times as tall with each day that passes.

Create a formula to describe the monster's growth.

How tall will the monster be after 3.7 days?

Going from large to small, you find another type of critter on the planet: alien amoebas! Since you're stranded on the planet and there's nothing else to do except run screaming from some of the inhabitants, you decide to study amoeba populations.

Typically animal populations grow by mommy and daddy animals making baby animals. (Hey - this lesson is G-rated!) Amoeba populations, on the other hand, grow by each amoeba splitting into two amoebas. So, if each alien amoeba splits into 2 amoebas every hour, can we create a formula to describe the growth of the amoeba population?

Let's say we start with 50 amoebas ...

TIME (t)	HEIGHT IN FEET

After t hours:  $50 \cdot 2^t$

Initial population: 50

Split factor (how many times it splits in 1 hour): 2

Number of splits: t

Hey! This is just like alien monster growth!!

Look familiar?

Okay, so, what if it gets more complicated? What if the amoeba doesn't make a complete split in one hour? What if it only makes part of the split in an hour?

Let's say that a certain alien amoeba splits into 1.25 amoebas each hour. If we start with 37 amoebas, how many will there be in 6 hours?

First, we need to write our growth formula:

$$\text{Number of amoebas} = \text{initial population} \cdot \text{Split factor}^{\text{time}}$$

Initial population: 37

Split factor: 1.25

Number of splits: 6

$$\text{Number of amoebas} = 37 \cdot 1.25^6$$

### YOUR TURN

If we start with 153 alien amoebas and each amoeba splits into 2.4 amoebas each hour, how many will there be in 7 hours? Write your equation first and then calculate your answer.

Let's get a little trickier ...

If we start with 200 alien amoebas and each amoeba splits into 1.7 amoebas every 12 hours, how many amoebas will there be in a week?

Set it up and think!

Initial population: 200

Split factor: 1.7

Number of splits: ?

Our split factor is for 12 hours ... there are two 12 hours time periods in 1 day ... and 7 days in a week ... You're correct ... the number of splits is 14.

So the equation looks like:

$$\begin{aligned} \text{Number of amoebas} &= \text{initial population} \cdot \text{Split factor}^{\text{time}} \\ &= 200 \cdot 1.7^{14} \end{aligned}$$