



## How strong are ants?

You need: Three chamber-nest including *Temnothorax* ants, tissue, spring steel tweezers, brush, weights (fir needles), tweezers, stereo microscope

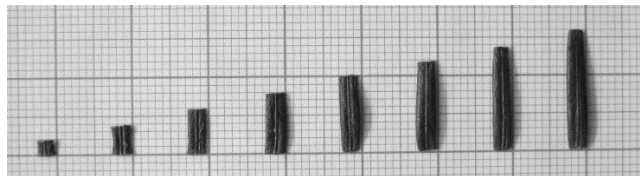
**Attention:** Lay out all the materials you need (weights!) and create your table before opening the nest!

1. Identify the (average) masses of different fir needle pieces and document the results in a table (M1).
2. Prepare different fir needle weights. If you do not have an accuracy weighing machine or enough time at your disposal, M2 will help.
3. Close the inlay nest's entrance using a piece of tissue.
4. Remove the red foil out of the three chamber-nest.
5. Open the inlay nest by shifting the transparent cover for max. 1.5 cm.
6. Spread your fir needles on the transparent cover.

**Attention:** Do not place any needles inside the inlay nest!

7. Observe the ants' behavior every 15 minutes under stereo microscopes (lights on!).
8. Document the number of needles which have been carried into the inlay nest every 15 minutes.
9. Close the three chamber-nest and leave the inlay nest open overnight. In the next lesson, document which needles have been carried into the nest.

### M2: Determining the masses of fir needle pieces



Fir needle length (mm)	Fir needle mass (mg)
2	0,9
4	1,9
6	3,2
8	5,8
10	7,6
12	9,3
14	10,2
16	13,6

These data refer to fir needle pieces of 3 mm width. The tips have been cut generously on both sides. These data are only references since single fir needles differ in their humidity, percentage of wood and stored nutrients.

## How strong are ants? (continued)



### M1: Structure of your table

<i>Fir needle length (mm)</i>	<i>Fir needle mass (mg)</i>	<i>Number of needles carried into nest after 15 minutes</i>	<i>Number after 30 minutes</i>	<i>Number after 45 minutes</i>	<i>Number the next day</i>
...	...	...	...	...	...



### Next lesson:

1. Remove the fir needles using tweezers and carefully close the inlay nest. Remove ants which might be bruised otherwise using the brush.
2. It is often said that ants may carry 30 times their own weight. A *Temnothorax* worker weighs approximately 0.4 mg. On the basis of your results, check the accuracy of this statement.
3. Estimate the mass a man with a body weight of 80 kg would be able to carry if he was as strong as an ant.
4. Try to find out why ants are much stronger than humans.