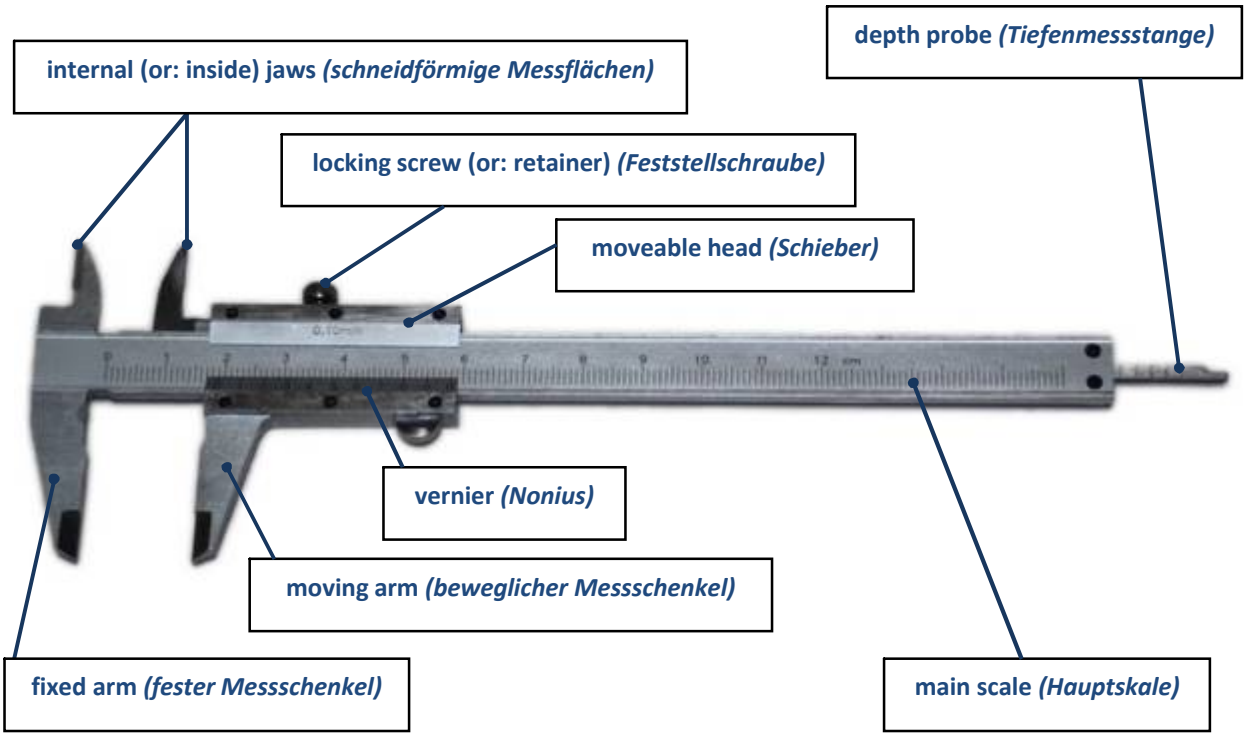
Read the text and label the vernier calliper.

VERNIER CALLIPERS ['vɜniə ˈkælɪpə(r)z]

To measure sizes to a tolerance of less than 1 mm, you need to use a measuring device which measures reliably and which can measure fractions of a millimetre, such as 1/10 or 1/20 mm.
A measuring device which fulfils this requirement is the vernier calliper. The two arms of the vernier calliper measure much more accurately than a ruler or a tape. The vernier calliper is particularly suitable for measuring diameters as it can measure the precise length between two points.
Using the vernier, it is possible to divide millimetres so they can be read to 1/10th or 1/20th of a millimetre.



The vernier is seen on the moving arm of the vernier calliper. On this vernier, the scale is 19 mm long. It is divided into 10 equal parts, so the distance from one vernier line to the next is 1.9 mm.
When the zero line on the vernier is in line with a line on the main scale, the distance between the measuring arms is in whole millimetres. When the moving arm is moved 1/10 mm, the zero line of the vernier is in line with a line on the main scale, the distance has increased to 0.1 mm. When the second line on the vernier scale is in line with a line on the main scale, it has moved 0.2 mm further. By using vernier callipers, you can measure to tenths of a millimetre. A vernier divided into 20 parts works according to the same principle.
Every vernier calliper has a locking screw or a retainer to fix the moveable head if necessary. A depth probe may be attached to the moveable head.
Vernier callipers can also be used to measure inside diameters or the depth of a hole. Inside diameters are measured with the help of internal (or inside) jaws that can be found at the top of the fixed arm and the moving arm.

Lösung / Solution 2
SCHIEBLEHREN / VERNIER CALLIPERS
Metallberufe / Metal Trades

TIPS FOR THE TEACHER

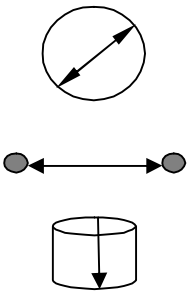
Possible after-reading tasks:

1. Label the picture.
2. Explain how vernier callipers work. *(for language scaffolding see below)*
3. *(Teacher provides students with vernier callipers.)*Take the vernier callipers and carry out the operations described between line 9 and line 13 of the text. Compare your results to the information in the text. Discuss possible reasons for differences.

Language scaffolding for task 2

To enable the students to explain how vernier callipers work, they need words and phrases they may rely on.

Talking about how vernier callipers work

<table>
<tr><th colspan="3">With vernier callipers you can</th></tr>
<tr><td>... measure</td><td>  </td><td>... the (inside) diameter of...

... the precise length between ...

... the depth of ...</td></tr>
<tr><th colspan="3">To take a measurement with vernier callipers,</th></tr>
<tr><td>first
then
after that
...</td><td>• add
• adjust
• check if.... works properly
• close .... lightly on ...
• find
• loosen
• make sure .... reads zero when fully closed
• make sure ..... is perpendicular to the calliper
• move
• read
• ...</td><td>the axis of a round object
the jaws
the locking screw/the locking lever
the centimetre mark on the main scale
the millimetre mark on the main scale
the moveable head (the slider)
the object you want to measure
the two marks on the vernier and the main scale that line up
the vernier calliper
this number to your reading
to the left of the zero-mark on the vernier
to the left of the zero-mark on the vernier scale
...</td></tr>
</table>

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