

TKx400i DUAL-LED MICROSCOPE

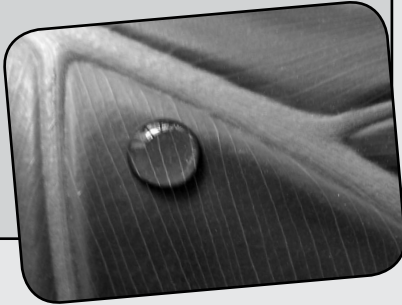
Instructions
for using the
microscope and
the accessories
included in
the kit

Quickstart Guide:
Descriptions of
the permanent
slide preparations
and tips for initial
investigations



Your New Microscope Page 5

How your microscope is constructed and what the parts are called



A First Look Pages 6 and 7

How to focus a microscope

The Permanent Mounts Pages 8 and 9

Wool,
frog's blood,
and onion skin



Check It Out Page 10

Lenses

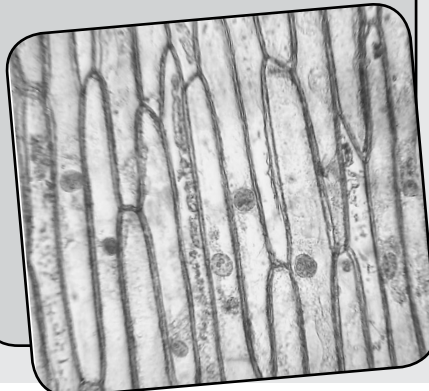
Macroscopic Examination with Reflected Light Page 11

The Equipment Pages 12 and 14

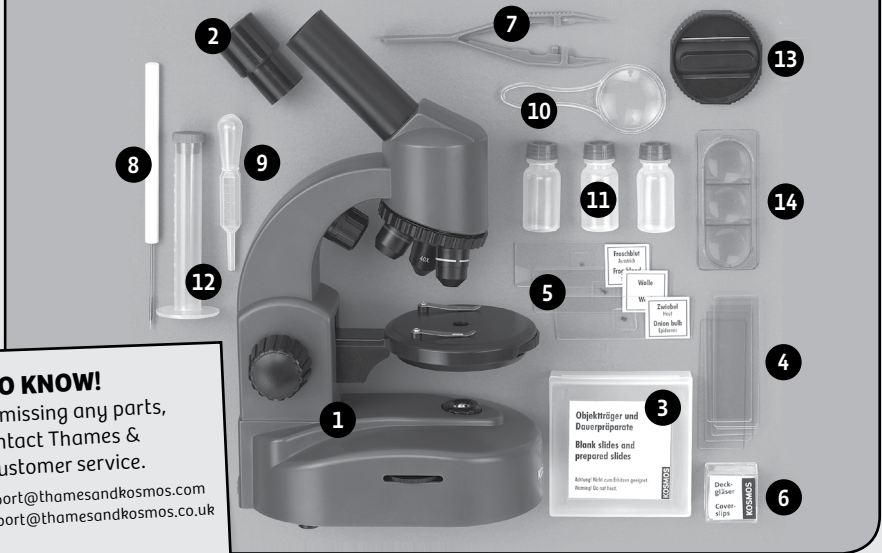
How to use the accessories in the experiment kit

Check It Out Page 15

Measurements under the Microscope



What's inside your experiment kit:

**GOOD TO KNOW!**

If you are missing any parts,
please contact Thames &
Kosmos customer service.

US: techsupport@thamesandkosmos.com
UK: techsupport@thamesandkosmos.co.uk

Checklist: Find – Inspect – Check off

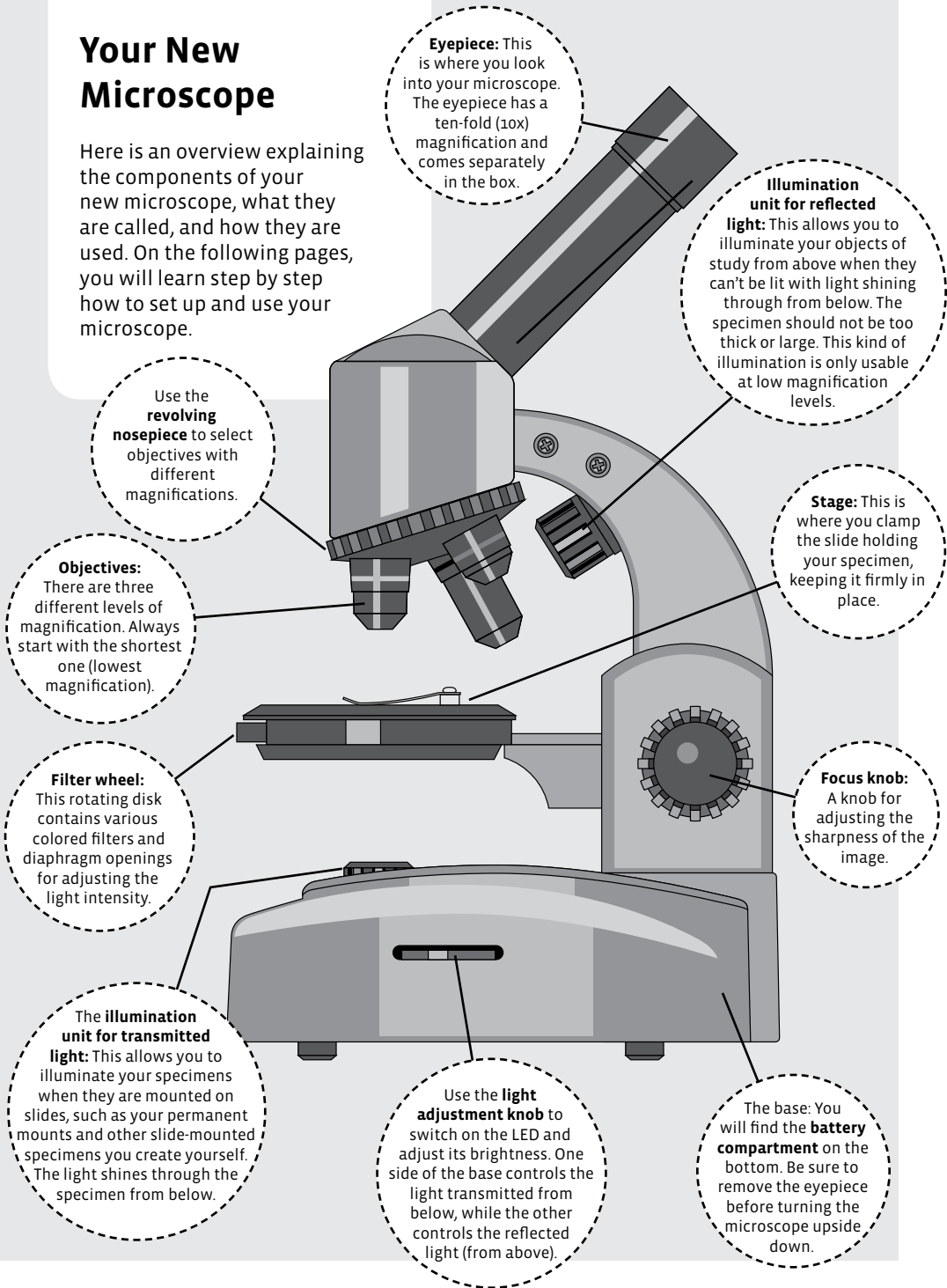
✓	No.	Description	Quantity	Order no.
<input type="checkbox"/>	1	Microscope	1	717 161
<input type="checkbox"/>	2	Eyepiece	1	718 090
<input type="checkbox"/>	3	Box	1	717 834
<input type="checkbox"/>	4	with specimen slides	10	
<input type="checkbox"/>	5	and permanent mounts		
<input type="checkbox"/>		Wool	1	718 086
<input type="checkbox"/>		Onion skin,	1	718 087
<input type="checkbox"/>		Frog's blood	1	718 088
<input type="checkbox"/>	6	Box with cover slips		
<input type="checkbox"/>		and sheet of labels	1	705 228
<input type="checkbox"/>	7	Tweezers	1	705 321
<input type="checkbox"/>	8	Dissecting needle	1	705 233
<input type="checkbox"/>	9	Pipette	1	717 169
<input type="checkbox"/>	10	Magnifying glass	1	717 170
<input type="checkbox"/>	11	Sample container	3	717 172
<input type="checkbox"/>	12	Graduated cylinder	1	717 175
<input type="checkbox"/>	13	Cutting tool (microtome)	1	717 177
<input type="checkbox"/>	14	Chambered sample box	1	717 178

You will also need:

*Three AA batteries
(1.5 Volt/LR6). In
addition, you will
need a variety of
natural and household
materials for some
of the preparations.
See the explanations
accompanying the
individual experiments.*

Your New Microscope

Here is an overview explaining the components of your new microscope, what they are called, and how they are used. On the following pages, you will learn step by step how to set up and use your microscope.



Eyepiece: This is where you look into your microscope. The eyepiece has a ten-fold (10x) magnification and comes separately in the box.

Illumination unit for reflected light: This allows you to illuminate your objects of study from above when they can't be lit with light shining through from below. The specimen should not be too thick or large. This kind of illumination is only usable at low magnification levels.

Use the **revolving nosepiece** to select objectives with different magnifications.

Stage: This is where you clamp the slide holding your specimen, keeping it firmly in place.

Objectives: There are three different levels of magnification. Always start with the shortest one (lowest magnification).

Focus knob: A knob for adjusting the sharpness of the image.

Filter wheel: This rotating disk contains various colored filters and diaphragm openings for adjusting the light intensity.

The illumination unit for transmitted light: This allows you to illuminate your specimens when they are mounted on slides, such as your permanent mounts and other slide-mounted specimens you create yourself. The light shines through the specimen from below.

Use the **light adjustment knob** to switch on the LED and adjust its brightness. One side of the base controls the light transmitted from below, while the other controls the reflected light (from above).

The base: You will find the **battery compartment** on the bottom. Be sure to remove the eyepiece before turning the microscope upside down.

The “Macro” Function of your Microscope

Up to now, you have familiarized yourself with the “normal” use of a microscope. Normally, you will study specimens on a glass slide that are so thin (or sliced so thinly) that light can shine through them from below. This also works for viewing microorganisms swimming in a drop of water, for example. This kind of microscopy is known as bright-field microscopy.

But you might sometimes want to study an object that is not small or thin enough to fit on a slide or for the light to shine through it — a leaf, a flower, a dead insect, or maybe a coin or a stamp. In such a case, you will only need a relatively low degree of magnification and light should shine on the object from above. This type of viewing of objects at magnifications of 40 times or less is sometimes called macroscopy, which is the viewing of objects that are visible with the naked eye, as opposed to microscopy, which is the viewing of objects that are too small to see with the naked eye.

There are special macroscopes for studying things like this, usually with 20-fold or 40-fold magnification and often with two eyepieces for binocular viewing, providing a three-dimensional image. Your microscope can do that too, though, in a simpler manner (at least for smaller and rather flat objects). For “macro” viewing, use the reflected light function of your microscope.

YOU WILL NEED

- Microscope with batteries
- Magnifying glass
- Flat objects to study such as a leaf, flower, stone, coin, paper money, or stamp

HERE’S HOW

1. Start by studying your object under the magnifying glass. Which areas seem interesting enough to warrant investigation under greater magnification?
2. Turn your revolving nosepiece to the lowest level of magnification (red ring). The other objectives are not usable for “macro” viewing. Place your object of study on the stage and turn on the reflected light illumination unit.
3. Adjust the focus as you look through the eyepiece. Nudge the object to find the most interesting areas on its surface.

