Articles

The use of articles (*a*, *an* and *the*) is very difficult in English. I have not written about each little rule, only the most important ones.

1. In front of singular countable nouns, there must be "something".
   Students most often leave out "a/an".

Examples:
Correct:
Lemuel is **a** doctor.
Lemuel is **the** doctor (for example, the only one in the village).
Lemuel is **our** doctor.
Lemuel is **that** doctor (he is standing there).
Incorrect:
~~Lemuel is doctor.~~

Other examples:
Have you got **a** car?
This is **a** mouse.
There is **a** cap on Peter's head.

2. In front of names, "the" is rare (rarer than in some languages, e.g. Hungarian).
   There are some well-defined exceptions, but they simply "prove the rule":

In front of names, "the" is not used.
(I provide a list of exceptions in a separate file.)

3. "a/an" is indefinite (it is not known or has not been mentioned before), the is definite (known by everybody or has been mentioned before)

Example:
I saw **a** lion. (The lion was not mentioned earlier, I used „a")
The lion was following **a** woman. (The lion was mentioned earlier ("the") but the woman was not ("a"))
The woman was pulling **a** cart. (The woman was mentioned ("the"), the cart was not ("a"))
The lion was smelling **the** cart. (Both the lion and the cart were mentioned earlier, therefore I used „the")
The cart was full of Whiskas.

"Definiteness" is very often expressed with a possessive structure.
The length of my car is 385 cm. ("Length" is made definite by "of my car".)

4. There are three types of generalizations.
   a) A tiger is a dangerous animal. (It means tigers in general.)

Here, a singular noun is used with "a/an". It is usually the subject.
b) The dog is a mammal.
The telephone was invented by Bell.
Here "the" is used with a singular noun. It is usually used with inventions and scientific categories.

c) No article is used (neither "the", nor "a/an"). Countable nouns are used in the plural, uncountable nouns in the singular. This type of generalization is by far the most common.
Examples:
Bears are dangerous. (generalization)
The bears are dangerous. (No generalization – we are talking about some bears who are definite, they were mentioned before.)
I like dogs. (generalization – countable – plural)
I like tea. (generalization – uncountable – singular)
I like apples. (generalization – countable – plural)
Let us see "definite" in a little more detail. Example:
The treatment improved mechanical properties.
You may think that *mechanical properties* is "definite" but grammatically, it is not. This problem is similar to the "definiteness" of abstract nouns, see below (5.).
Of course, if you want "mechanical properties" to be definite at all costs, there are ways to achieve that grammatically. Two common methods:
the mechanical properties of the material (possessive)
the mechanical properties that/which we tested (relative clause)
Use these tricks if you cannot accept in any way that "mechanical properties" alone is practically always indefinite, and therefore cannot take "the". ☺ ☺ ☺

5. And now the greatest problem for most learners of English: abstract nouns.
In English there must not be a definite articles in front of abstract nouns (unless they are definite). Example:
Teaching is difficult.

a) Examples of abstract nouns (abstract nouns are usually uncountable)
1. Normal everyday words: nature, life, love, anger, happiness…
2. Everyday and technical words: crystallinity, length, width, surface roughness, cell structure, delamination, time, (tensile) strength, wettability, foaming agent content, melt temperature, density, cross-link density, elongation at break, permeability, temperature, (cold) crystallization, average cell diameter, cell population density, T-RTM, aging/ageing, tool wear, layer thickness, particle size distribution, GTR content, cooling uniformity, cooling time, insert efficiency, cooling, light transmission, resistivity, conductivity, relative humidity, porosity, immersion, withdrawal (speed), impregnation…
Some endings usually indicate an abstract noun.

b) Some endings usually indicate an abstract noun.
In Hungarian: ás/és, ság/ség,
Examples: gazdagság (richness, wealth), szegénység (poverty), éhség (hunger), hülyeség (stupidity), ásás (digging), alvás (sleeping), evés (eating)
In English:
– ing (often): longing, eating, bonding, injection molding
– age (often): shrinkage, postage,
– ance/ence: (often) brilliance,
– ancy/ency (often) hesitancy, complacency
– ery (when not a place, like bakery): slavery, bravery, machinery
– hood (often): childhood, manhood
– manship: marksmanship

– ness (often): kindness, loudness,
– ship (often): friendship
Internet sources define abstract nouns as things that cannot be perceived with the five senses. That would be a nice, simple definition (if it worked ☺) but I started thinking.
How about ***surface roughness/loudness/brightness/hardness/temperature,*** etc.?
(touch) (hearing) (sight) (touch) (touch) ☺
Because these are abstract nouns, too! ☺
Examples of abstract nouns:
I love ***sport/nature/life***. (not definite)
Life in 13th century England was not easy. (still not definite)
The sport (that) they love best is curling. (definite – *that/which* defines the abstract noun)
He lives ***the life*** he has always dreamed of. (definite – see above)
Anger can be controlled. (not definite)

We can make an abstract noun definite in several ways (for example with a defining relative clause – *that/which*) but the most common way is with a following "of…" construction.
Some more examples:
We treated the samples. As a result, ***crystallinity*** increased by 20%. (not definite)
The crystallinity of the samples increased by 20%. (definite)
After ***impregnation***… (not definite)
The impact of ***humidity*** on ***light transmission*** is considerable… (not definite)
The treatment improves ***light transmission***. (not definite)
Humidity influences several properties of the material. (not definite)
The humidity of ambient air needs to be measured. (definite)
Quality depends on ***treatment time***. (not definite)
The quality of the products depends on ***treatment time***. (definite + not definite)
Activator ***concentration*** did not change during the process. (not definite)
The concentration of the activator influences the process. (definite)
Activation increased ***the concentration*** of −OH groups on the surface (not definite + definite)

c) Abstract nouns can be general or "concrete". It is easier to imagine that an abstract noun in a general context does not have "the" because we do not have "the" in the most common type of generalization, either (see 4.). Examples:
Length is an important characteristic.
Roughness has an effect on ***bonding strength***.
With these interlayer techniques, ***interlaminar fracture toughness*** can be enhanced.
Due to the different zones, ***crack propagation*** changes.
During ***3D printing***, the melt solidifies at a high cooling rate.
Electrospinning was carried out with the following parameters:
There are no standard test methods for measuring ***interfacial adhesion*** between layers printed by FFF.
Therefore, an increase in ***bed temperature*** can help ***adhesion***.

d) However, when the abstract noun has a "concrete" meaning, the situation is trickier. If the meaning is concrete, is it not definite? Can we not use "the"? Examples of concrete situations:
We measured ***elongation at break***.
Crystallinity did not change.

The process decreased ***foam density***.
Foaming agent content had an effect on mechanical properties.
We used a simpler method to determine ***cell population density***.
Particle size distribution was measured twice.
Efficiency was not affected.
The most important parameters were ***melt temperature*** and ***holding pressure***.
Holding time was doubled.
Average tensile strength was determined before ***flexural strength***.
There was no improvement in ***bonding***.
During ***overmolding***, we measured …
Orientation was examined.
We quantified the extent of ***warpage***.
Twisting slightly increased with ***homogenization***.
Pore size slightly increased.
We used SEM to quantify ***fiber length distribution***.
…test results showing ***long-term behavior***.
The magnitude of ***relaxation*** was greater than we expected.
Loading consisted of an uploading segment and…
We used four-node bilinear axisymmetric quadrilateral elements for ***discretization***.
It clearly indicates the nonlinear nature of ***damping***.
Contact time during the first impact was also analyzed.
As ***contact time*** increases and ***maximum acceleration*** decreases with ***thickness***, an optimum can be found where both parameters are in the appropriate range.
Another important factor is ***moisture content***.
They developed a method three decades ago to determine ***hardness*** from ***indentation depth***.
They also showed that ***creep compliance*** correlates with ***molecular weight***.
The filling of nanocomposites also decreases ***creep deformation***.
Hardness decreased by 50%.
In-mould coating is commonly used for ***compression moulding*** and ***injection moulding***.
(here coating is an activity, not a layer!)
Tool geometry may all substantially affect ***cutting force*** and ***torque***.
…and then ***polyaddition*** takes place under appropriate conditions.
Mixing time was 30 min.
However, ***gradual failure*** did not occur in their studies; the specimens suffered ***brittle failure*** after maximum load.
…examine their effects on ***interfacial adhesion***.
Printing distance was not included because it is difficult to adjust precisely.
Layer height and ***printing speed*** were adjusted.
We also investigated the effect of ***infill density***.
Shrinkage was a problem but we greatly reduced it.

This is a very tricky situation: we are talking about a concrete situation, so **logically** it may be definite but is it definite **grammatically**? Well, it is far more “difficult” for an abstract noun (noun phrase) to be definite grammatically than logically. The above examples are not definite enough to be definite grammatically! Actually it is quite difficult for an abstract noun (noun phrase) to be grammatically “definite” without “external help”, so the easy rule is that it is best to consider an abstract noun (noun phrase) indefinite when it is “alone”. The

most common construction that makes an abstract noun definite in technical English is the "of…" construction. Let us see examples:
The length of the product is important.
We measured ***the length*** of the product.
Let me show you an advanced trick ☺: when you feel the abstract noun (which is alone) is (logically) definite but you are not sure if it is grammatically definite (it would require a practically native-level knowledge of English to decide), you can make it definite with an "of…" construction.
Let us take an example from above:
Crystallinity did not change.
"Crystallinity" is not definite grammatically, even though you did a concrete experiment with well-defined (and previously mentioned) materials!!! If you feel it should be definite, make it so:
The crystallinity of the specimen did not change.
And voilá! You got what you wanted ("the" in front of "crystallinity"), and still you can be sure that the sentence is correct! ☺☺☺ Wow! What more could a researcher ask? ☺☺☺

Here are some more examples of abstract nouns (noun phrases) that can be used in the above example sentences as well:
width, surface roughness, quality, cell structure, cross-link density, permeability, layer thickness, GTR content, cooling uniformity, cooling time, insert efficiency, cooling, light transmission, resistivity, conductivity, porosity, withdrawal (speed) …

6. 'In front of' the 'of' structure, there is almost always a 'the'.
~~*Legs of the table are thin.*~~
*<u>The</u> legs **of** the table are thin.*
*She lives in <u>the</u> United States **of** America.*