

Keeping Silkworms



Teacher Notes written by Rodney Martin

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ABOUT THIS BOOK

Author: Josephine Croser

Text features

Organisation

contents page; index; further references;
resource list; lists; cross-references

Text

captions (explanations, sequenced instructions); headings; parentheses

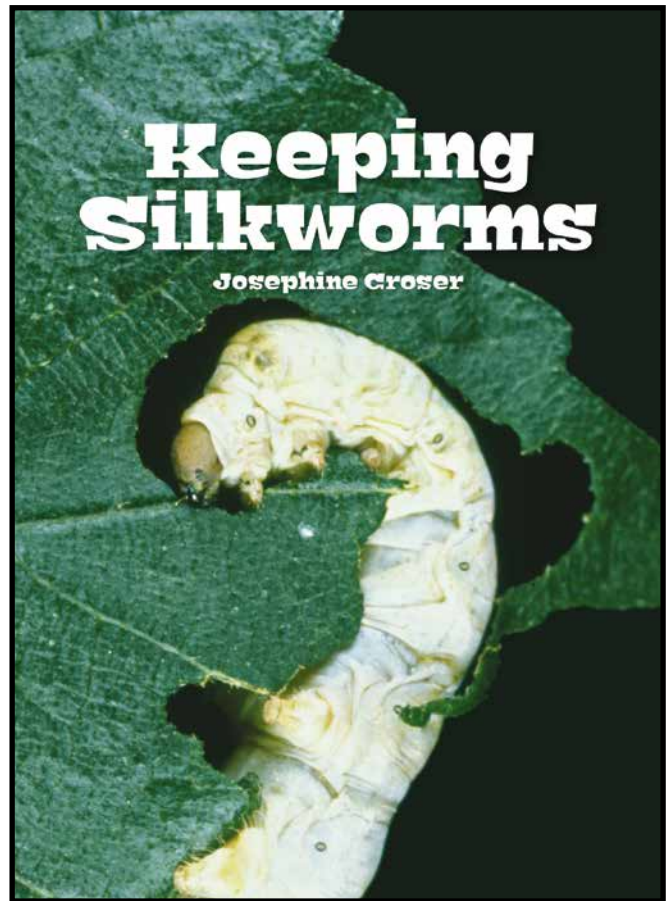
Visual

Summary charts; timeline charts (seasons, weeks); magnified photographs; sequenced photographs; instructional diagrams

Text type

Procedure – a ‘how to ...’ text; explains how to do something

Report – parts of the text include aspects of a report; they present facts about a topic



Reading level

16 pages. Suitable for

- independent readers aged 9–11
- guided reading with readers aged 6–8

Interest level

As a source of information and interest, this book is appropriate for children aged 6–11+ .

Synopsis

A manual for raising silkworms, harvesting their silk, using the silk to make a bookmark and preparing for the next season

NB: Silkworms naturally hatch from the eggs in early spring. Your program will need to take account of this and allow about nine weeks if you wish to observe the complete life cycle. You will also need a ready supply of mulberry leaves from a local tree.

Themes

- Science – natural and processed materials
- Studies of society and environment – biological science, life-cycles; use of resources
- Mathematics – counting and estimating; measuring; graphing; scale
- Arts – craft

READING

Modelled / shared reading

Prediction – reading the cover

It is important that children can use cover clues to predict the probable text type.

- You could ask pupils whether they expect to find information or a story in this book. Children could support their predictions with reasons. (*The title and the photograph are strong clues that this is a work of nonfiction.*)
- You could draw attention to the word **Keeping** in the title and ask pupils what might be the purpose of the book. (*A present participle in titles often suggests a procedural ‘how to ...’ text.*)
- You could show children the back cover, then ask them to review their ideas about the purpose of the book. (*The back cover strongly suggests that this is a procedural text – an ‘activity’ book.*)

Raising questions

It is useful, in sharing nonfiction texts, to work from the children’s interests.

- What questions would the children like to find answers to about the topic?
- What do the children already know about the topic?

Introducing the book

You could introduce the book by reading the contents page and asking the children to give their views on the content by referring to and commenting on the photographs and illustrations.

- Children could summarise the sequence and scope of the content.
- You could inform the class – or allow them to discover – that the contents page is a list of the chapter or section headings.
- Children could discuss why the author presented the information in that order. (*It is the natural order of events in the life cycle of a silkworm. Procedural texts present information in the order of its occurrence in a process.*)
- Discuss the arrangement of information in the numerical order (pp. 9-12) for instructions in a procedure

Planning

With a procedural text, it makes sense to plan the proposed activity. This particular activity is dependent upon the natural life cycle of an insect.

- The class could study the timeline charts and discuss the times of the year when the activity can be carried out.
- The section **Setting up the farm** (p. 3) is important for determining priorities for action.

Specific detail

It is appropriate to search for specific information in the text.

- You could use the contents page and index to locate answers to children’s questions.

Instructions

- At various stages of the activity of keeping silkworms, children may refer to particular sections of the text for specific instructions. The same text may be referred to many times by children to confirm the correctness of procedures as they carry them out over the weeks.
- Some instructions can be read and followed in one session, for example, ‘Collecting the silk’ (*see p. 10*).

Verifying events

As the silkworms and moths go through their various stages of development, the text provides a means of verifying events.

- You could periodically review the text and compare it to observations and recordings of actual events.

Critical reading

It is important that children understand the need to verify the information in a nonfiction text.

- It should be noted that the author is not presented as an scientific expert on the topic. (*Relevant qualifications are not stated after the author's name.*)
- Students could locate the name and qualifications of the technical consultants used in the writing of this book. (*Imprint page: Hans Mincham, Dianne Wiskich*)

Viewing

Photographs

The magnified photographs on pages 3 and 4 could be discussed.

- What is the purpose of magnified images? (*To allow closer examination of small objects.*)
- What could be a problem in viewing magnified images? (*The reader might get an incorrect idea of actual size.*)

Sequence

You could draw attention to the sequential images on pages 10–12.

- How does the reader know the order in which the pictures should be read? (*The captions show a numerical order.*)
- Why is the order of the images important? (*The process and the activities depend on a particular sequence.*)

Discussion points

Children already have knowledge and experience with caterpillars and insects in their natural environment.

- Is it cruel to keep silkworms in farms? (*Silkworms are now a human-dependent species. It is unlikely that they would survive in the wild. In commercial operations, the pupae usually die as the cocoons are immersed in hot water.*)
- Where did silkworms originate (*China*)
- What other natural fibres are farmed? (*wool – sheep, goats, alpacas; cotton – plant*)
- Why might silk be an expensive material to buy? (*It is a labour-intensive process.*)

Further reading

- Various books on silkworms could be borrowed from a library. A list is included under **Further References** (p. 17) in the book.

Research

Children could be directed to related topics of interest for further research. The results of their research could be published as a report.

- Other insects that are farmed (*bees – for honey; butterflies – for tourists*)
- Where are silkworms farmed commercially?
- Is there a synthetic silk?

Writing

Letter writing

In a demonstrated writing session, you could write a letter to possible sources of silkmoth eggs.

- In a guided writing session, groups of children could write letters to potential sources of silkmoth eggs or mulberry leaves.
- Writing a thank you note to people who provided mulberry leaves

Recount – journal

Throughout the activity of keeping silkworms, the class could keep a journal, class diary or wall chart, noting dates, procedures and outcomes.

Changing the text type – report, recount

The procedural text of **Keeping Silkworms** is only one way of dealing with the content. The same or related content could be presented as a report text.

- Facts could be researched and recounted as ‘The Story of Silk’, and how the idea spread from China to various parts of the world.
- An information report could be done on the life cycle of the silk moth.

Changing the text type – explanation text

- Children could draw pictures and write captions representing the various stages of silk production and use.
- This same activity could be used to explain the life cycle of other animals (*frogs, butterflies, ducks, mosquitoes etc*).

(Worksheet 1: Sequencing)

Procedural text

Using **Keeping Silkworms** as a text model, you could help children to produce their own procedural text. Children could use group composing to write their own big book on:

- making kites
- rules for playground games
- making decorations
- making paper planes
- recipes for salad, sandwiches etc.

Captions

Captions serve various functions in the text.

Labelling or identifying an object

Describing an activity

Describing an event in a process

Giving instructions

Silkmoth eggs magnified (p. 3)

Choosing mulberry leaves (p. 5)

The silkworm attaches itself to the box. (p. 9)

Step 6. Turn the winder over and over. (p. 10)

- In a shared reading session, the various functions of captions could be discussed.
- In a guided writing session, children could draw pictures about a nonfiction topic and write appropriate captions.

(Worksheet 1: Sequencing)

SPECIFIC LANGUAGE KNOWLEDGE

Grammar

Commands

The text contains many examples of commands, because procedural texts give instructions telling the reader what to do. Commands can be expressed in compound sentences. (*The main clause of a command usually begins with an action verb. This is because the subject of the verb is 'you' and it is usually not stated.*)

Put the silkmoth eggs into a box and place it in a room with fresh air and light. (p. 3)

Step 6. Turn the winder over and over. (p. 10)

- As you read the text in a shared reading lesson, children could identify the commands.
- Wherever the commands are prolific in the text, the class could discuss the purpose of the text at that point. (*Frequent use of commands suggests a procedural text rather than a report.*)
- Children could convert statements to commands by changing some words and word order in a sentence.

Put each silkworm into its own space. (p. 8)

Each silkworm is put into its own space.

(Worksheet 2: Word order)

Conjunctions

Clauses can be joined with various conjunctions, such as *because, and, so, then, until, before, where* and *when*.

Now feed them larger leaves and feed them more often. (p. 7)

Silkworms moult four times before they are ready to spin. (p. 8)

- Children could use clauses and conjunctions on strips of cardboard or paper. These strips could then be manipulated to form various sentences.
- You could explain that in a procedural text, the order of the clauses is important because they explain a sequence of events in a process.

(Worksheet 2: Word order)



Compound sentences

The author uses compound sentences in various ways.

to link related ideas

The females' eggs will then be fertile and will hatch next year. (p. 13)

to add reasons to an action

Put about five or six silkworms into each box so they are not overcrowded. (p. 6)

- In a shared writing session you could explain that compound sentences are formed by joining simple sentences with conjunctions such as *and*, *but*, *so*, *or* and *yet*.
- Examples could be identified within the text.
- Children could practise joining simple sentences to link ideas.
- Children could experiment with the order of clauses in compound sentences from the text. Individual clauses and conjunctions could be printed on pieces of paper. Does a change in order of sentence parts alter the meaning of the sentence?

(Worksheet 3: Sentences)

Singular and plural

Some parts of this text report facts about silkworms. The verbs in a report text are usually in the simple present tense.

Silkworms **go** through changes before they **are ready** to spin. As they **grow**, silkworms **get** too big for their skins, so they **shed** the old ones. (p. 8)

- You could cover some verbs in the book with sticky notes. As the class reads the text, children could suggest what verbs could be under the sticky notes.
- You could demonstrate what happens to the verbs if the subjects are singular in the above example from the text.

A silkworm goes through changes before it is ready to spin. As it grows, a silkworm gets too big for its skin, so it sheds the old one.

- Children could change sentences from plural to singular, or vice versa.

(Worksheet 4: Singular and plural)

Pronouns – possessive

The text contains examples of possessive pronouns.

Look for these changes when **your** silkworm spins **its** cocoon. (p. 9)

- Children could discuss why certain pronouns are called 'possessive' pronouns. (*Because ownership of the following noun is attributed to them – 'your' owns 'silkworm' and so a possessive form of 'you' is used in an adjectival function within a noun group*)
- In a shared writing session, you could help children to list the possessive forms of the following pronouns – me, you, he, she, we, they. (*my, mine; your, yours; his; her, hers; our, ours; their, theirs*)
- You could point out that, unlike possessive nouns, possessive pronouns do not have an apostrophe – in particular, *its*. The word *it's* is a contraction of *it is*.

Lists

Bullet point lists are sometimes a listing of clauses in a complex sentence.

You can tell when silkworms are about to spin because they:

- **stop eating;**
- **become shorter;**
- **wave their heads in the air;**
- **lose a drop of brownish liquid from their mouths.** (p. 9)

- You could discuss why bullet point lists might be useful in some nonfiction texts. (*They allow the author to give individual attention to a number of points in a long complex sentence. It can make such a sentence easier to read.*)
- In a demonstrated writing session you could use a writer's guide to look up the writing conventions for creating lists, and explain them to the class.
- Children could rewrite certain passages from the text as bullet point lists by joining a series of short sentences into one long sentence.

For the first two weeks, feed your silkworms three times a day. Make sure you only give them small leaves. Dry the leaves if they are wet. (p. 5)

(Worksheet 5: Lists)

Verbs – tense

Procedural and report texts are usually written in the simple present tense.

Dry the leaves if they **are** wet. (p. 5)

Silkworms **go** through changes before they **are** ready to spin. (p. 7)

In procedures, the author sometimes uses clauses to describe something that must happen before an activity is to take place. For these clauses, the author often uses the past tense.

After the silkworms **have crawled** onto it, put the leaf into another box. (p. 5)

In procedures, the author must sometimes alert the reader to things that will happen or be needed. In these sentences, the author often uses the future tense.

To set up a farm you **will need** ... (p. 3)

Your silkworm eggs **will hatch** in spring. (p. 15)

- In a shared reading session, you could draw attention to the various tenses used in the text and explain the reason for their use.
- You could point out that verbs used to give instructions in the text are simple verbs in the present tense. (*They are in the imperative form – go, put, pick, use, move etc.*)
- Children could identify and classify verbs in the text according to their tense.
- You could explain the use of auxiliary verbs (*is, are, has, have, will* etc) in verbs groups.

(Worksheet 6: Verbs)

Punctuation

Various punctuation marks are used throughout the text.

apostrophe (possession)	partner's finger (p. 11), female's eggs (p. 13)
apostrophe (contraction)	Don't put silkworms, moths or eggs ... (p. 3)
bullet points	see ' <i>Lists</i> ' above.
colon and semicolon	see list on page 8 of text.
comma	They moult at about 6 days, 12 days, 18 days and 26 days. (p. 7)
exclamation mark	Warning! (p. 3)
hyphen	newly-hatched (p. 4)
parentheses (brackets)	(See steps 1 to 6.) (p. 10)

- You could point out that in this text the colon is used to signal a list. Bullet points define individual items in a list. List points may end with a comma, a semicolon or nothing depending on whether the items are words, phrases or clauses.
 - Children could consult a writer's guide for information on the conventions pertaining to each punctuation mark.
 - Entries could be written for pupils' personal style journals, recording definitions and writing samples with the conventions they have learned about various punctuation marks.
 - You could comment on how punctuation marks are used to assist with clarity of meaning in more complex sentences.
- (*worksheet 7: Punctuation*)

Type

Italics

In this text, italics are used to indicate a defined word.

This is called *moulting*. (p. 7)

- You could comment on the structure of sentences that are definitions, in particular the passive form of the verb *to call* (*is called; are called*).
- Children could be encouraged to use some form of emphasis (for example, underlining) when defining terms in their nonfiction writing.



WORD KNOWLEDGE

Vocabulary

Singular and plural

There are various ways of forming the plural of words in English. The text offers some examples.

leaf/leaves (p. 4)

box/boxes (p. 6)

pupa/pupae (pp. 9, 13)

silkworm/silkworms (p. 8)

Some words in the text are used only in the plural form.

droppings (p. 6)

scissors (p. 3)

- You could comment on or demonstrate the use of plural words such as *scissors* in sentences.
- The class could discuss and describe the spelling patterns that emerge from the various examples of singular and plural forms.

(Worksheet 4: *Singular and plural*)

Spelling

Suffixes

Suffixes can be used to modify the form of a word so that it serves another function.

-ing participles: **moulting** (p. 7)

nouns: **the spinning** (p. 10)

-er nouns: **winder** (p. 10)

adjectives: **larger** (p. 6)

-ly adverbs: **gently** (p. 10)

-ed verbs: **crawled** (p. 4)

- Children could search the text for other words that follow these spelling patterns and list them.
- The lists could be used to observe whether particular spellings and sounds are common or unusual.
- You could have children investigate the spelling pattern that occurs when *-er*, *-ly* or *-ed* are added to words ending with the letter *-y*. (for example, *carry*, *happy*, *tidy*)

(Worksheet 8: *Words*)



Root words and derivations

By examining the roots within words, children can observe the various affixes used to create derivations, and the spelling patterns associated with the use of affixes.

magnified (p. 3):	magnify, magnum, magnificent, magnifies, magnifying
opposite (p. 11):	oppose, opposed, opposition, opponent, position, pose
directions (p. 11):	direct, indirect, director, directed, directional
partner (p. 11):	part, partnership
finished (p. 12):	finish, unfinished, final, finale, finally, finite, infinite, infinity, definite, definitely

- Children could explain the meaning of the above words and other examples from the context of the book.
- English words could be compared to words with the same meaning in other languages (*magnifique [French], magnifico [Italian], fin [French], finito [Italian, Spanish]*). You might even explore the etymology of some words.
- Using a dictionary and thesaurus, children could see how many words they can find related to a word such as *finish* or *magnify*.

(Worksheet 9: Words)

Shades of meaning

- Children could examine shades of meaning in particular words within the text.
- They could investigate alternatives for these words by consulting a thesaurus.
- Words that are similar in meaning could be defined to highlight how a certain word might be the best choice for a particular meaning.

look/observe	gather/collect/store	keep/save
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(Worksheet 9: Words)



ACROSS THE LEARNING AREAS

Mathematics

Counting and estimating

- Children could estimate the number of eggs laid by one female silkworm. They could check their estimation by counting a section of the eggs on a grid, then multiplying the count by the number of equivalent sections.
- Estimates could be made about the number of eggs and silkworms that could be bred in one or two seasons.
- Children could record and observe the number of leaves eaten by a particular silkworm during its life (or a given period). From these records, they could estimate how many leaves (or mulberry trees) would be needed to feed all the silkworms they could breed in one or two seasons. Would such a project be feasible?

Measuring

- Children could invent ways of estimating the length of silk in a cocoon. For example, they could measure one turn on a winder, then count the number of turns made to unwind a cocoon.
- The variation in lengths of silk taken from a number of cocoons could be measured and observed.
- The size (length and thickness) of a silkworm could be recorded as it grows.
- The diameter of a silkworm egg could be measured/estimated using a ruler and perhaps a magnifying glass. A comparison could be made with the photographs on pages 3 and 4 to calculate how much the eggs have been magnified.

Graphs

Children could record in some form of graph, information they gather while observing silkworms.

- the size of a silkworm each week of its life
- the number of eggs laid by different silkworms
- the number of leaves eaten per week by the silkworms at various stages of their development
- the length of silk in various cocoons.

Scale

The time lines on pages 15 and 16 use different time scales.

- You could comment on the fact that the time line on page 15 is shorter than that on page 16, yet it covers a longer period of time.

Science

Life cycle

You could use the content of **Keeping Silkworms** as an example of the life cycle of an insect. Children could record the stages of development in the cycle as an investigation.

(Worksheet 1: Sequencing)

Art and craft

Children could use the silk to create objects other than bookmarks. For example, silk could be plaited to make key ring holders.

FURTHER INFORMATION ON SILKWORMS

(by Josephine Croser)

Hints on management

Eggs

- Store silkmoth eggs in a cool place, free of insecticides. If kept near a heater or airconditioning, the eggs may hatch prematurely – long before mulberry leaves are available in spring.
- The eggs often hatch a week or so before the mulberry leaves come out. Two ways of coping with, or preventing, the time gap:
 1. Start feeding the silkworms on an alternative leaf (for example, lettuce) and switch to mulberry as soon as possible. (Silkworms fed entirely on lettuce produce poor quality silk or may not spin at all.)
 2. Put the eggs into a refrigerator to delay hatching. Remove from the cold when leaves are available. After a few days most of the eggs should hatch and the caterpillars can have mulberry leaves from the very start.

Silkworms

- Use fresh young leaves for tiny silkworms. Chewing is facilitated if the leaf edges are torn in a few places.
- Any sick-looking silkworm should be removed. They sometimes appear different in colour and texture from healthy ones.
- Don't be confused or worried about a silkworm that is standing still and not eating – it could be moulting.
- Old leaves and droppings should be removed daily to avoid the growth of fungi.
- Silkworms should be kept in clear, smoke-free air, away from sunlight and pesticides. Loud noises may disturb them and interrupt feeding.

Pupae and moths

- Each silkworm should be provided with its own spinning corner. If two silkworms spin together, the silk cannot be unwound.
- Keep records of when spinning began so that winding may be started after one week. Winding must be completed before moths appear (two to three weeks after spinning began).
- Before spinning, the silkworm usually produces a dropping surrounded by watery liquid and a drop of brownish liquid from the mouth. These can be noted as signs, not problems. They are a natural part of the process.
- Beware of predators. The moths, especially, seem vulnerable to attack from ants, cockroaches, mice or household cats.
- Silkmoths often produce a spatter of brownish liquid before they start to lay eggs.
- Although they cannot fly, silkmoths may crawl out of a shallow box and lay eggs on the table or wall. It is easier to store silkmoth eggs if they are laid on cardboard.

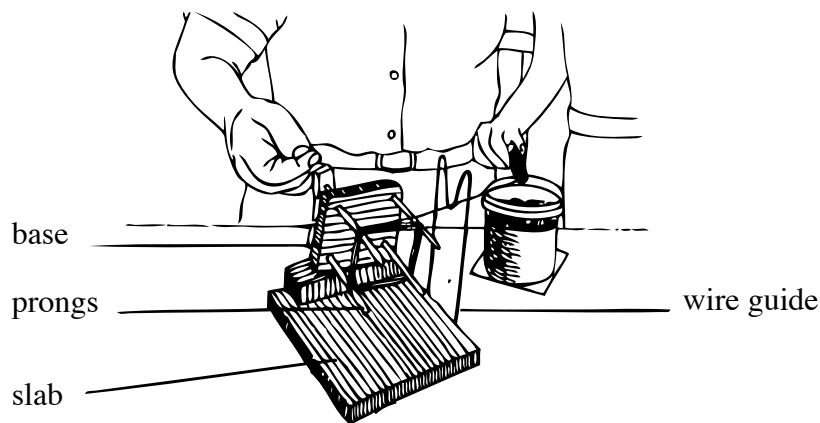
Winding the silk

Silk may be wound in either of two ways.

1. Dry winding, see **Keeping Silkworms**, page 10.

2. Wet winding

- The newly-spun silk is damp and, as it dries, each layer of the thread sticks to the underlying ones. Warm water helps release the thread.
- Wet winding is best done with a rotating, pronged winder (see diagram p.13), most easily made from wood. The winder needs a base that can be clamped to a table, a slab with four wooden prongs and an M-shaped wire guide for the thread.



- Silk can be wound from several cocoons simultaneously. Find the single thread (see **Keeping Silkworms**, page 10) for each cocoon. Place the cocoons in a cup of warm water (about 40°C).
- Guide the threads through the wire frame and wrap around a wooden prong. Commence winding, gently. If a thread snaps, find the end and wrap it once more around the prongs.
- When all the silk has been removed, dry the pupae by placing them on cotton wool. Moths should still emerge from them, but keep a few cocoons aside (these can be wound dry) to be really sure you will have some moths for breeding.

Fascinating facts

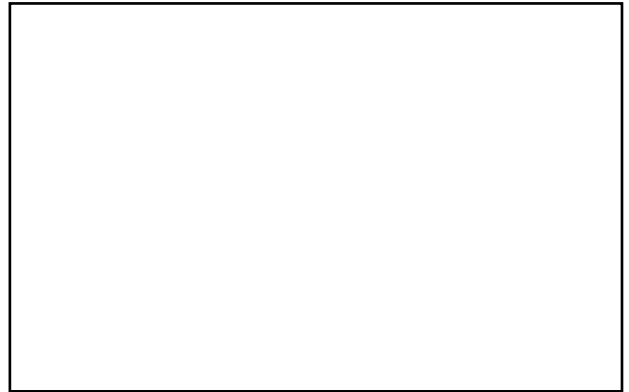
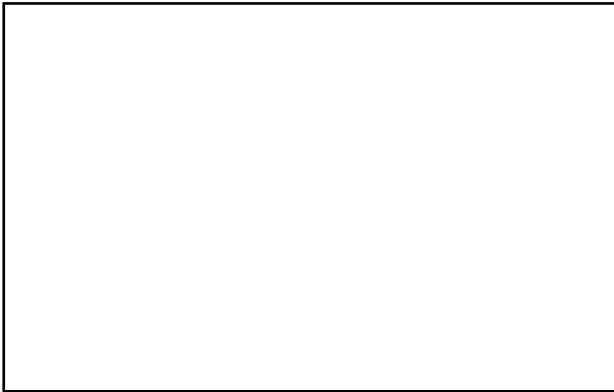
- The hatching silkworm chews a hole in the egg and then crawls out.
- The emerging moth produces a liquid from its mouth. The liquid dissolves the silk fibres at one end of the cocoon to allow the moth to come out.
- Silkworms feed both day and night, and can be heard chewing when the environment is quiet.
- Silkmoths do not eat or drink. They have no teeth, jaws or proboscis.
- Silk is the longest natural fibre.
- Silk is the strongest natural fibre for its thickness.
- Silk comes in different colours (from gold to yellow, lemon-green to white).
- Synthetic fibres are used to imitate silk or used in a fibre blend to weave cloth. Artificial silk includes materials such as rayon.
- Silkworms were first kept in China thousands of years ago. Weavers used the fibres to make clothes for the emperor and his family or for sale in other lands. The origins of silk were kept secret and buyers wondered if it came from flowers. The secret of silk spread to India and Japan and later to Europe. Now silkworms are kept in many countries.
- The domesticated silkworm is called *Bombyx mori*. It no longer lives in the wild. Other species of silkworm are found in the wild. Some have been domesticated to a degree but the silk they produce is inconsistent in thickness and the threads tend to break.
- Silkworms are not worms but caterpillars. There are four stages in the life cycle of a silkworm:
 1. egg stage (lasts about nine and a half to ten months)
 2. larval stage (lasts about five to six weeks)
 3. pupal stage (lasts about two to three weeks)
 4. moth stage (moths live for about one week)

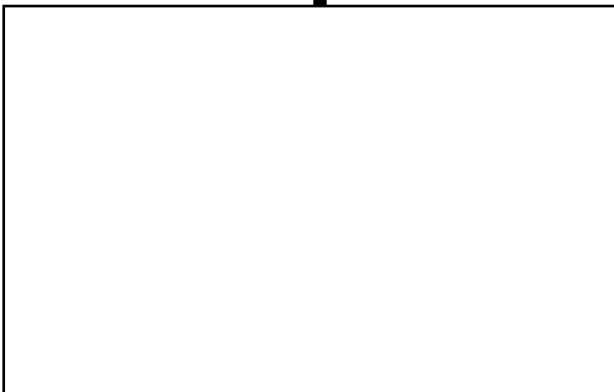
KEEPING SILKWORMS

(Worksheet 1: Sequencing)

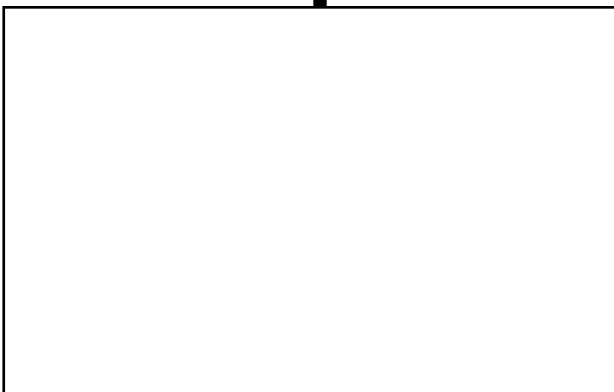
Draw pictures in the boxes. Write captions on the lines.

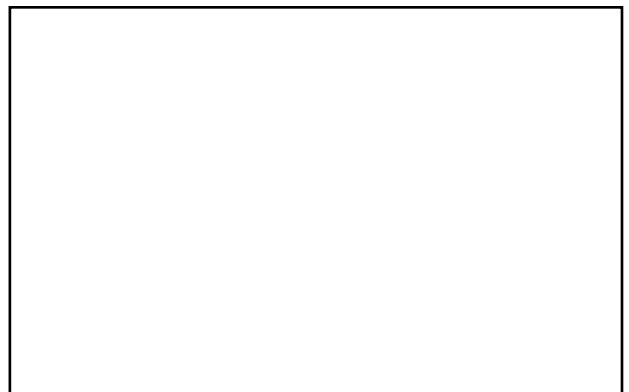
The life cycle of _____











KEEPING SILKWORMS

(Worksheet 2: Word order)

1. Use these phrases and words to write one sentence that is a statement and one that is a command. You can change some letters to capitals and delete some words if necessary. Add full stops.

into its own space each silkworm put is

2. Use the words *when*, *before*, *and* or *so*, to join the groups of sentences and phrases below.

feed them large leaves feed them more often

spins its cocoon your silkworm
look for these changes

separate the silkworms as they spin
at this time their silk does not tangle

KEEPING SILKWORMS

(Worksheet 3: Sentences)

1. Choose the correct words to complete this sentence. Write the words on the lines.

Silkworms/A silkworm		shed/sheds	
grow/grows	go/goes	it/they	gets/get
its/their	are/is	skins/skin	

_____ through changes before they _____ ready to spin. As _____, _____ too big for _____, so _____ the old ones.

2. Choose the correct words to complete this sentence. Write the words on the lines.

Silkworms/A silkworm		shed/sheds	
grow/grows	go/goes	it/they	gets/get
its/their	are/is	skins/skin	

_____ through changes before it _____ ready to spin. As it _____, _____ too big for _____, so _____ the old ones.

KEEPING SILKWORMS

(Worksheet 4: Singular and plural)

1. Write the plural forms of these nouns.

box _____ silkworm _____
leaf _____ body _____

2. Use a dictionary to find the plurals of these nouns.

pupa _____ fungus _____
larva _____ medium _____

3. Choose the correct noun to complete these sentences.

silkworm

silkworms

The _____ move to new leaves without help.

The _____ attaches itself to the box.

leaf

leaves

If the _____ is wet, dry it.

Give young silkworms only small _____.

cocoon

cocoons

moth

moths

The _____ come out of their _____
three weeks after spinning.

Collect the silk from the _____ before the _____
comes out.

KEEPING SILKWORMS

(Worksheet 5: Lists)

1. Rewrite this paragraph as a bullet point list.

For the first two weeks feed your silkworms three times a day. Make sure you only give them small leaves. Dry the leaves if they are wet.

- _____
- _____
- _____

2. Rewrite this list as a sentence.

Don't put silkworms, moths or eggs:

- In direct sunlight
- Near a heater
- Under an airconditioner
- Where insect spray may drift onto them.



3. Write a bullet point list of the things you need to play your favourite game.

- _____
- _____
- _____
- _____

KEEPING SILKWORMS

(Worksheet 6: Verbs)

1. Write these verbs in the correct lists below.

will need	is called	has ended
have crawled	are trying	will begin
was spinning	will hatch	put

<i>past tense</i>	<i>present tense</i>	<i>future tense</i>

2. Use these auxiliary verbs to complete these sentences.

have	could be	are	will	has	is
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When the eggs _____ beginning to hatch, put a fresh leaf in the box. After the silkworms _____ crawled onto it, put the leaf into another box. Do this each day until hatching _____ ended.

If a silkworm _____ not eating, and _____ holding its head high, then it _____ getting ready to moult.

About three weeks after spinning, moths _____ come out of the cocoons. When the males and females _____ mated, the females' eggs _____ be fertile and _____ hatch next year.

KEEPING SILKWORMS

(Worksheet 7: Punctuation)

1. Proofread this list. Fill in the missing punctuation marks.

When your silkworms are growing you need to
avoid overcrowding them in a box
keep them away from sunlight and insect spray
empty their droppings from the box each day
replace the leaves with fresh ones each day

2. Change the word order of these sentences without changing the meaning. Use apostrophes (').

Loop the silk around the finger of your partner.

As the body of the silkworm grows, the silkworm sheds its skin.

3. Make the meaning of these long sentences clearer by using punctuation marks.

Silkworms moult at about six days twelve days eighteen days and twenty six days a total of four times before they are ready to spin.

Silkworms around about to spin when they stop eating become shorter wave their heads in the air and lose a drop of brownish liquid from their mouths.

KEEPING SILKWORMS

(Worksheet 8: Words)

Use these suffixes to change the words so they make sense in the sentences below. Write the words in the spaces. You can add more than one suffix to a word.

<i>Suffixes:</i>	-ing	-er	-es	-ly	-ed	-s
<i>Words:</i>	silkworm	usual	crawl	thin		
	early	week	stop	pack		
	try	feel	body	slight		

After _____ have _____
onto the new leaf, put it into another box.

This _____ the silkworms from
_____ over new ones which are
_____ to hatch.

Silkworms _____ begin to spin when
they are five to six _____ old. Some
may spin even _____.

The females have large _____. They
are _____ with eggs. Their feelers are
_____ feathery. The males have
_____ bodies. Their _____
are very feathery.

KEEPING SILKWORMS

(Worksheet 9: Words)

1. Use prefixes and suffixes to create other forms of these words.

magnify

oppose

finish

direct

2. Write a short definition for each of these words to show how they differ in meaning.

look

observe

gather

collect

store

keep

save

