Classification

Classification of Animals

Animals

With Backbones
- Fishes
- Birds
- Amphibians

Without Backbones
- Reptiles
- Mammals

Classification of Plants

Do you know who Abu Hanifa al Dinawari (d.895AD) ابوعنیفه احمد بن داوود دینوری was?

He lived in Andalusia (Spain) and wrote a book classifying plants a long time ago! Called: Kitab al-Nabat
• Classification of living things
• Vertebrate Animals
• Invertebrate Animals
• Classification using a tree key
• Plant classification

• Skills you will be using:
  • Classifying
  • Observing

By the end of this unit you should know:
  • Curriculum standards: 4.1, 4.2

  ▪ How to place an animal into its major Vertebrate and Invertebrate Taxonomic group
  ▪ Use a tree key to classify animals into taxonomic groups.
  ▪ Differentiate between internal and external fertilization in vertebrates.

Key words:
Backbone. العظام الفقري
Vertebrates. الفقاريات
Mammals, reptile, birds, fish, amphibians
Classification of living things

Because there are so many varied (different) living things, Scientists need to keep dividing them into smaller groups so that it would be easy to identify them. They look for differences and similarities to put the living things into groups. We can tell the difference between living things by observation. New living things are discovered every day.


Classification is sorting things into groups according to their common Characteristics.

**Activity:**
In the kingdom of your classroom use the following information to write your classification.

<table>
<thead>
<tr>
<th>Phylum</th>
<th>Boy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Girl</td>
</tr>
<tr>
<td>Class</td>
<td>Right handed</td>
</tr>
<tr>
<td></td>
<td>Left handed</td>
</tr>
<tr>
<td>Order</td>
<td>Can roll tongue</td>
</tr>
<tr>
<td></td>
<td>Cannot roll tongue</td>
</tr>
<tr>
<td>Family</td>
<td>Can wink either eye</td>
</tr>
<tr>
<td></td>
<td>Can wink only one eye</td>
</tr>
<tr>
<td>Genus</td>
<td>Can raise only one eyebrow</td>
</tr>
<tr>
<td></td>
<td>Can raise both eyebrows</td>
</tr>
<tr>
<td>Species</td>
<td>Can wiggle ears</td>
</tr>
<tr>
<td></td>
<td>Cannot wiggle ears</td>
</tr>
</tbody>
</table>
■ What is your classification?

■ Who else in your class has exactly the same classification?

Here is an example of how animals are classified:

بعض الأمثلة على تصنيف الحيوانات
• Living things are classified into small **Taxonomic groups**.

• The taxonomic groups are:
  
  Kingdom, Phylum, Class, Order, Family, Genus and Species.

  (the first letters of all words combined make up the word: --------)

**All living things are classified into 5 kingdoms:**

• 2 major kingdoms: Plants and Animals (النبات و الحيوان) 

• 3 kingdoms of Simple organisms: Monera, Protista and Fungi.

(ثلاث ممالك بسيطة (البكتيريا, الفطريات, الأوليات))

**Protista**

**Plant**

**Fungi**

**Monera**
<table>
<thead>
<tr>
<th>Kingdom</th>
<th>Important characteristics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Animals</strong></td>
<td>Many-celled, feed on other living things</td>
<td>Monkey, birds, frogs, fish, and spiders</td>
</tr>
<tr>
<td></td>
<td>لديها العديد من الخلايا – تعتمد على غيرها في التغذية</td>
<td>القرود, الطيور, الضفادع, الأسماك</td>
</tr>
<tr>
<td><strong>Plants</strong></td>
<td>Many-celled, make their own food</td>
<td>Trees, flowers, ferns, and mosses</td>
</tr>
<tr>
<td></td>
<td>عدة خلايا – تصنع غذائها بنفسها</td>
<td>الأشجار, الورد</td>
</tr>
<tr>
<td><strong>Fungi</strong></td>
<td>Most many-celled, absorb food from other living things</td>
<td>Mushrooms, yeast, and mold</td>
</tr>
<tr>
<td></td>
<td>عدة خلايا – تمتقص الغذاء من الكائنات الحية</td>
<td>المشرور، الخميرة و العفن</td>
</tr>
<tr>
<td><strong>Protists</strong></td>
<td>Most one-celled with nuclei, some make their own food, others do not</td>
<td>Amoeba, الأميبا</td>
</tr>
<tr>
<td></td>
<td>تقريبا خليه واحدة تحتوي على نواه، بعضها يصنع غذائها بنفسها</td>
<td></td>
</tr>
<tr>
<td><strong>Monerans</strong></td>
<td>One-celled, no cell nuclei, some make their own food, some feed on living things</td>
<td>Bacteria البكتيريا</td>
</tr>
<tr>
<td></td>
<td>تتكون من خليه واحدة لاتحتوي على النواة، البعض منها يصنع غذائها بنفسها، البعض الآخر ينتمى على كائنات الكائنات الحية</td>
<td></td>
</tr>
</tbody>
</table>
The five kingdoms

Key words:
- Classification
- Taxonomic groups
- Kingdom, phylum, class, order, family, genus, species

Classification is sorting things into groups according to their common characteristics.

Key Questions:
Fill in the gaps in the following questions:

1. Living organisms are divided into five kingdoms:
   تقسم الكائنات الحية إلى خمس ممالك
   
<table>
<thead>
<tr>
<th>Kingdom</th>
<th>Phylum</th>
<th>Class</th>
<th>Order</th>
<th>Family</th>
<th>Genus</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

2. ....................... is sorting things into groups according to their common characteristics.
   فرز الأشياء إلى مجموعات تبعاً إلى الصفات المشتركة بينهم.

3. Use the internet or a book to name a member of each one of the five kingdoms:
   - Animal: ....................
   - Plant: ......................
   - Monera: .....................
   - Fungi: .....................
   - Protista: ..................

   Project: Find out the types of deer found in Qatar?
All animals (kingdom) in the world can be put into one of two groups:

- Animals with a backbone are called **Vertebrates**. (phylum)
- Animals without a backbone are called **Invertebrates**. (phylum)
- The phylum **Vertebrate** is common characteristics: **Vertebrates**

<table>
<thead>
<tr>
<th>Class</th>
<th>Important characteristics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphibians</td>
<td>Have moist skin, begin life in water</td>
<td>Frogs and salamander</td>
</tr>
<tr>
<td></td>
<td>(الجلد رطب، تبتدي حياتها في الماء)</td>
<td>(الضفادع)</td>
</tr>
<tr>
<td>Birds</td>
<td>Have wings and feathers, lay eggs</td>
<td>Eagles, owls</td>
</tr>
<tr>
<td></td>
<td>(لديها أجنحة و ريش و تضع البيض)</td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>Have scales, spend their entire lives in water</td>
<td>Salmon</td>
</tr>
<tr>
<td></td>
<td>(لديها حراشف، تعيش حياتها في الماء)</td>
<td></td>
</tr>
<tr>
<td>Mammals</td>
<td>Have hair, make milk for their young</td>
<td>Cats, dogs</td>
</tr>
<tr>
<td></td>
<td>(لديها شعر، تغذي صغارها الحليب)</td>
<td>(الكلب و القطة)</td>
</tr>
<tr>
<td>Reptiles</td>
<td>Have dry, scaly skin, lay eggs</td>
<td>Lizards, snakes</td>
</tr>
<tr>
<td></td>
<td>(جلدها جاف، يضع البيض)</td>
<td>(الحيه)</td>
</tr>
</tbody>
</table>
Grade 6 Unit L.3-Classification

Vertebrate Animals

Fish

Amphibians

Reptiles

Birds

Mammals
Key ideas:

Animals that have a backbone are classified in a phylum called Vertebrates.

Vertebrate animals are classified into 5 classes, Mammals, reptile, birds, fish and amphibians.

Key words:

Backbone. Vertebrates. Mammals, reptile, birds, fish, amphibians

Key questions:

Fill in the gaps to complete the following sentences:

Animals that have fur and give birth to their young

Animals that live in water, reproduce by laying eggs

Animals that have feathers and reproduce by laying eggs

Animals that have dry scaly skin live in wet land and reproduce by laying eggs

Animals that start their life in water and live their adult life on land, reproduce by laying eggs and have smooth, moist skin.

Key ideas:

Animals that have a backbone are classified in a phylum called Vertebrates.

Vertebrate animals are classified into 5 classes, Mammals, reptile, birds, fish and amphibians.

Project:

Choose an animal from Qatar's environment, and put it in its correct classification:

In order to do that you will need to
1. observe the animal
2. Collect information about the animal
3. Place the animal into it's correct taxonomic group
# Invertebrate Animals

The Phylum Invertebrates is classified into 6 classes. Animals are sorted into these classes because they share common characteristics.

<table>
<thead>
<tr>
<th>Class</th>
<th>body</th>
<th>Habitat</th>
<th>Movement</th>
<th>example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coelenterate</td>
<td>Sac-like, soft body</td>
<td>Water</td>
<td>Tentacles and stinging cells</td>
<td>Jelly fish</td>
</tr>
<tr>
<td></td>
<td>لينه الجسم</td>
<td></td>
<td>مخالب و خلايا لاذعة</td>
<td>قنديل البحر</td>
</tr>
<tr>
<td>Segment worms</td>
<td>Soft round body divided into segments</td>
<td>Water and land</td>
<td>Hair called chaetae</td>
<td>Earth worm</td>
</tr>
<tr>
<td></td>
<td>جسم مدور مقسم إلى أجزاء</td>
<td></td>
<td>شعر</td>
<td>دودة الأرض</td>
</tr>
<tr>
<td>Molluscs</td>
<td>Soft body covered by shell</td>
<td>Water and land</td>
<td>Large muscular foot</td>
<td>snails</td>
</tr>
<tr>
<td></td>
<td>بدن ناعم مغطاه بصدفة</td>
<td></td>
<td>أرجل رخويه كبيرة</td>
<td>الحالوزون</td>
</tr>
<tr>
<td>Echinoderms</td>
<td>Star shaped Hard skin covered with spines</td>
<td>Water</td>
<td></td>
<td>Star fish</td>
</tr>
<tr>
<td></td>
<td>جسم على شكل نجمه</td>
<td></td>
<td></td>
<td>نجمه البحر</td>
</tr>
<tr>
<td>Flat worms</td>
<td>Flat body</td>
<td>Water and Land</td>
<td></td>
<td>Planarian</td>
</tr>
<tr>
<td></td>
<td>جسم مسطح</td>
<td>الماء و الياسية</td>
<td></td>
<td>البلاترانيا</td>
</tr>
<tr>
<td>Arthropods</td>
<td>Hard exoskeleton</td>
<td>Water and land</td>
<td>Jointed Legs</td>
<td>Insects</td>
</tr>
<tr>
<td></td>
<td>هيكل خارجي صلب</td>
<td>الماء و الياسية</td>
<td>أرجل متصله</td>
<td>الحشرات</td>
</tr>
</tbody>
</table>

Curriculum standards: 4.2

Invertebrates: Animals without a backbone
اللافقاريات: حيوانات بدون عامود فقاري
Invertebrate Animals

- Coelenterates
- Flat worms
- Molluscs
- Echinoderms
- Segmented worms
- Arthropods

Insects
Key words:
Invertebrates
Flat worms, Molluscs, Echinoderms, Round worms, Coelenterate, and Arthropods.

Key ideas:
- Animals without a backbone are classified in Invertebrate phylum.
- Invertebrate animals are classified into 7 classes. Each group of animals share common characteristics.

Key Questions:
Place the animal in the correct group: (jelly fish, segmented worm, star fish)
- An animal that has a round body divided into segments
- An animal that has a sac like body, stinging cells and tentacles
- An animal that has a star shaped body covered by spines
Classification using a tree key

Sorting living things: How could you find out the name of a plant or animal?

You could look through the pictures in a book until you found the right one. That would take a lot of time and effort.

Scientists use keys to identify living things. A key has a number of questions.

- You start at the beginning and answer “yes” or “no” to each question. It soon takes you to the plant or animal you want.
- Use the following branching key to identify the animals below.

Start here

Has it got 6 legs?

- Yes
  - Has it got hard wing cases?
    - Yes: Housefly
    - No: Beetle

- No
  - Has it got 8 legs?
    - Yes: Beetle
    - No: Spider

  - Has it got more than 20 legs?
    - Yes: Housefly
    - No: Spider
Activity 1:

Use the Following tree key to classify the following Vertebrate animals into their correct groups:

- Does it have fins?
  - Yes
  - Fish
  - No
    - does it have Feathers?
      - Yes
        - it is a bird
      - No
        - Does it have fur or hair?
          - Yes
            - it is a mammal
          - No
            - Does it have Dry scaly skin?
              - Yes
                - Millipede
              - No
                - Wood Louse
Activity 2:
Use the Following Tree Key to classify the invertebrate animals in the pictures labeled (A–F):

Start here:
Does it live On land?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does it have A flat body?</td>
<td>does it have stinging cells?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Flat Worms</td>
<td>Echinoderms</td>
</tr>
<tr>
<td>No</td>
<td>yes</td>
</tr>
<tr>
<td>Arthropods</td>
<td>Coelenterate</td>
</tr>
</tbody>
</table>

A
Arthropods

B

C
Molluscs

D
F

is the body Covered by

yes
Molluscs

no
Does it have A segmented body?

Key words:
- Tree key
- Branches

Key ideas:
- Scientists use tree keys to classify unknown animals
  العلماء يستخدمون مفتاح الشجرة لتصنيف الحيوانات غير معروفة
- You should start with one organism at a time.
  لا بد أن تبدأ بكلائن واحد في كل مرة.
- Answer all the questions for that organism.
  أجب على كل الأسئلة المتعلقه بهذا الكائن.
- Move to another organism after you finish the first one.
  أنتقل الى كائن اخر عن الانتهاء من الكائن الأول.

Project:
What is your favourite animal?
Construct a tree key to classify your favourite animal.

Key Questions:
1- Define tree key?

2- from page 16 And 17 answer the following questions by putting true or false:
   - a- flat worm have flat body ( )
   - b- molluscs have jounted legs ( )

FROM PAGE 16 AND 17:

- a- flat worm have flat body
- b- molluscs have jounted legs
Curriculum standards: 4.2
Scientists have described and named millions of plants. They think that millions more will be discovered in the future.

There are many ways in which botanists can classify plants, one way of classifying plants is to see if they bear flowers or not.

Botanists classified plants in the following groups according to their common characteristics:

- Algae
- Conifers
- Ferns
- Mosses
- Liverworts
- Flowering plants
  - Monocotyledon
  - Dicotyledonous
Use the following branching tree key to place the plants in the 2 following pictures in their correct taxonomic group:

1. [Image 1]
2. [Image 2]

Your plant:

Does it have a flower?

Yes

Does it live in water?

No

Does it have 2 cotyledons?

No

Does it produce seeds?

Yes

Monocotyledon

inside cones?

Algae

Yes

It is a conifer

No

Fronds?

It is a fern

Does it have leaves called?

No

It is green?

Yes

It is a fungi

No

Does it have a thin Leathery body?

No

It is a liverwort

Yes

it is a moss
Key ideas:
- Botanists classify plants into two major groups, flowering plants and non flowering plants.
- The flowering plants are divided into 2 groups, monocotyledon and Dicotyledon.
- The non flowering plants are divided into 5 groups: mosses, liverworts, algae, ferns and conifers.
- Scientists use branching tree keys to identify unknown plants.

Key words:
- Classification
- Monocotyledon
- Dicotyledon
- Liverworts
- Mosses
- Algae
- Ferns
- Conifers

Key Questions:
we can use the classification key to classify plants in many ways.
- Plants are divided into two main groups: ................... And
  ............................  .......................  .............. and ............................
- Flowering plants are divided into two parts: ......................
- Non flowering plants are divided into five groups:  ......................
- Collect leaves from different trees,
  - find three different features for each leaf, and make a tree key to classify the leaves.

Project:
Gather some information about the classes of the plants you have studied and try to construct a simple branching tree key.