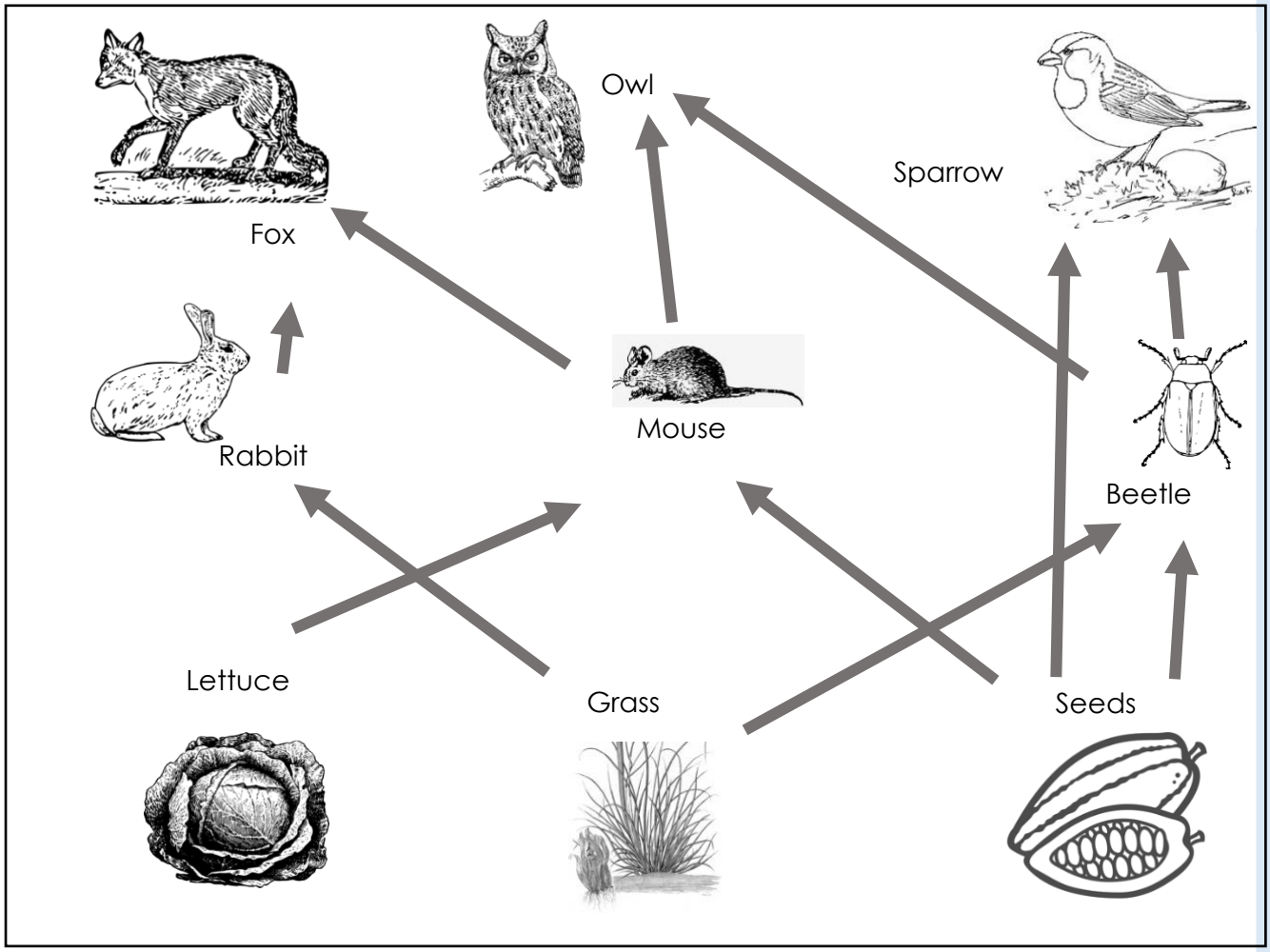
Prior Knowledge Review – Human Interaction

Mark Scheme

1. Use the following food web to answer the questions:



a. Identify any **producers** (circle the name of the species in **green**).
Lettuce, grass and seeds (which are from fruit plants)

b. Identify any **primary consumers** (circle the name of the species in **blue**).
Rabbit, mouse, beetle, sparrow

c. Identify any **secondary consumers** (circle the name of the species in **black**).
Fox, owl, sparrow

d. Identify any **predators** (put a black dot next to the name of the species).
Fox, owl, sparrow

e. Identify any **prey** (put a blue dot next to the name of the species).
Rabbit, mouse, beetle

f. Determine which species are **herbivores** (draw a square around the name of the species).
Rabbit, mouse, beetle

g. Determine which species are **carnivores** (draw a triangle around the name of the species).

Fox, owl, sparrow

h. Describe what would happen if the population of rabbits was suddenly reduced.

- **The foxes would have fewer rabbits to eat**
- **They would eat more mice**
- **The population of mice would decrease**
- ***This could affect the population of owls***
- ***Owls and foxes would be competing with each other more***
- ***Owls would eat more beetles***
- ***Population of beetles would decrease***
- ***This could affect the population of sparrows***
- ***There would be an increase in the growth of lettuce***

i. Describe the effects of introducing a new species of sparrow into this food web.

- **Sparrows eat beetles and seeds**
- **There would be more competition for these resources**
- **The better competitor would survive and take the resources**
- **This could affect the population of existing sparrows**
- **The population of beetles would decrease**
- **This could affect the population of owls**

j. Explain what the arrows represent in a food chain or a food web.

The direction of energy transfer

2. Plants and animals compete with each other for a number of resources.

a. State the resources that animals compete for.

Space, food and mates

b. State the resources that plants compete for.

Space, water, minerals and light

c. Explain the difference between biotic and abiotic factors.

Biotic factors are living things that can affect a community, abiotic factors are non-living.

d. Classify all factors from Q2a and Q2b as biotic or abiotic factors.
   - **Space – abiotic**
   - **Food – biotic**
   - **Mates – biotic**
   - **Water – abiotic**
   - **Minerals – abiotic**
   - **Light – abiotic**

Stretch activity

Some students are researching the biodiversity of a field that contains a large oak tree. They have hypothesised that there will be fewer plants growing in the area around the tree than anywhere else in the field. Suggest a method for them to test their hypothesis and suggest a reason for their hypothesis.

- **They could use a transect – a straight line through the field**
- **They could use quadrats at regular intervals along the transect**
- **Count the number of plants in each quadrat**
- **Analyse the data to determine if there is a difference between the number of plants present in the different areas**
- **Their hypothesis is based on the theory that the tree will be outcompeting the plants for the available sunlight and it will have a deeper root system so will be able to absorb the available water**