Lab #1: Using a Biological Key

Purpose: Classification is a way of separating a large group of closely related organisms into smaller subgroups. With a classification system, identification of an organism is easy. The scientific names of organisms are based on the classification systems of living organisms. To classify an organism, scientists often use a key. A key is a listing of specific characteristics, such as structure and behavior, in such a way that an organism can be identified. In this lab, we will:

1. **study the method used in making statements of a key.**
2. **use a key to identify certain insect species.**
3. **use the key to identify fourteen shark families.**

Materials:

metric ruler
insect key / insect diagrams
shark key / shark diagrams

Procedure:

Part 1: Keying Sharks

1. Use Fig. 1 as a guide to the shark parts used in the key in Table 1.
2. Read sentences 1A and 1B of the key. Study Shark 1 in Fig. 2 for the characteristics referred to in 1A and 1B. Follow the directions in these sentences and continue until a family name for Shark 1 is determined.
3. Continue this process with each shark until all animals have been identified. Label the family name on the line below each diagram.

Part 2: Keying Insects

1. To identify insect A in Fig. 3, begin with paired descriptions 1a and 1b in Table 2. One and only one of the descriptions should apply. If you find a number at the end of the description, is guides you to the next pair of descriptions. If you find a name at the end of the description, that should identify your insect. Of course, this key applies only to these specific kinds of insects. It will not identify any organisms not included in its construction.
2. Continues identifying until you have named and labeled all insects in Fig. 3 (A-M)
3. Study Fig. 4 and compare how the flow chart differs from the key.

Table 1: Shark Identification Key

1. A. Body kitelike in shape (if viewed from the top)..... Go to statement 12
   B. Body not kitelike in shape (if viewed from the top)..... Go to statement 2

2. A. Pelvic fin absent and nose sawlike..... Family Pristiophoridae
   B. Pelvic fin present..... Go to statement 3

3. A. Six gill slits present..... Family Hexanchidae
   B. Five gill slits present..... Go to statement 4

4. A. Only one dorsal fin..... Family Scyliorhinidae
   B. Two dorsal fins..... Go to statement 5

5. A. Mouth at front of head rather than back along underside of head..... Family Rhinocodontidae
   B. Mouth back along underside of head..... Go to statement 6

6. A. Head expanded on side with eyes at end of expansion..... Family Sphyrnidae
   B. Head not expanded..... Go to statement 7

7. A. Top half of caudal fin exactly same size and shape as bottom half..... Family Isuridae
   B. Top half of caudal fin different in size and shape than bottom half..... Go to statement 8

8. A. First dorsal fin very long, almost half total length of body..... Family Pseudotriakidae
   B. First dorsal fin regular length..... Go to statement 9

9. A. Caudal fin very long, almost as long as entire body..... Family Alopiidae
   B. Caudal fin regular length..... Go to statement 10

10. A. A long needlelike point on end of nose..... Family Scapanorhynchidae
    B. Nose without long point..... Go to statement 11

11. A. Anal fin absent..... Family Squalidae
    B. Anal fin present..... Family Carcharhinidae

12. A. Small dorsal fin present near tip of tail..... Family Rajidae
    B. No dorsal fin present near tip of tail..... Go to statement 13

13. A. Front of animal with two hornlike appendages..... Family Mobulidae
    B. No hornlike appendages..... Family Dasyatidae

Fig. 1: Guide to Shark Parts

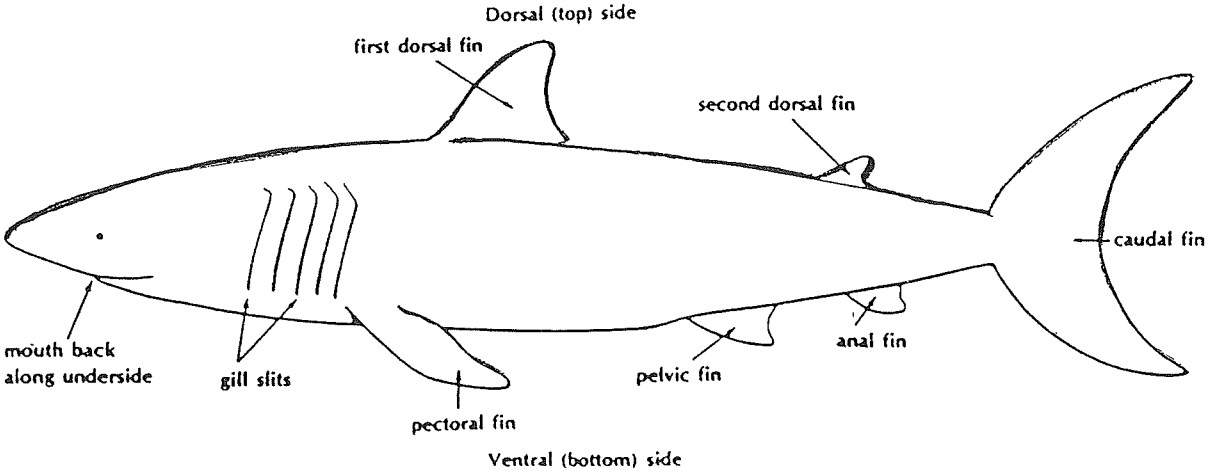


Fig. 2: Shark Diagrams

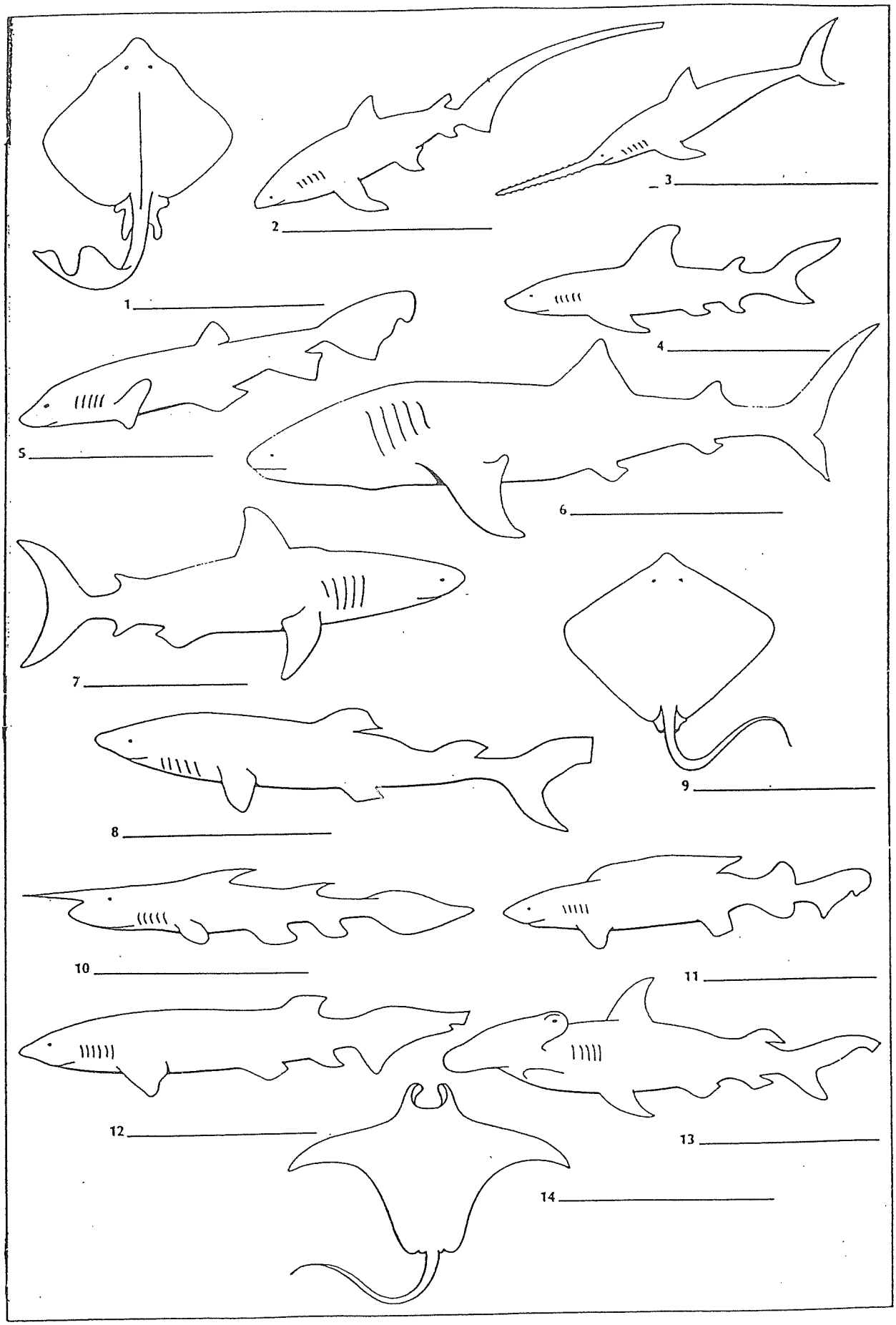
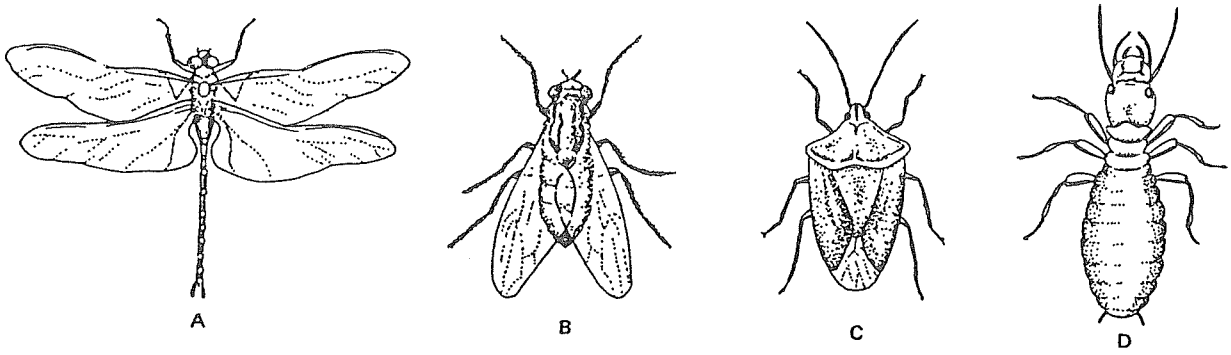
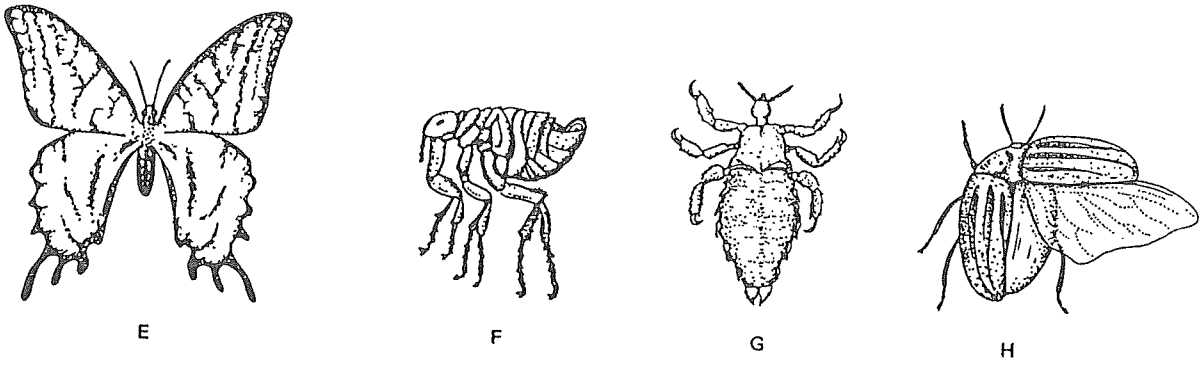


Table 2: Identification Key of Certain Insects

1a.	Insect with wings	2
1b.	Insect without wings	7
2a.	Wings all fully transparent with wings clearly visible	3
2b.	Wings not all fully transparent	10
3a.	Hind wings absent	Housefly
3b.	Front and hind wings present	4
4a.	Hind wings about the same size as front wings	Dragonfly
4b.	Hind wings smaller than front wings	5
5a.	Two or three long slender tails	Mayfly
5b.	No long slender tails	6
6a.	Wings at rest held like roof over body	Cicada
6b.	Wings at rest not held like roof over body	Bee
7a.	Three long slender tails	Silverfish
7b.	No long slender tails	8
8a.	Head almost as wide as body	Termite
8b.	Head much narrower than body	9
9a.	Head connected to body by a narrow neck	Louse
9b.	Neck not especially narrow	Flea
10a.	Wings held against body when at rest	11
10b.	Wings not held against body when at rest	Butterfly
11a.	Hind legs enlarged for jumping	Grasshopper
11b.	Hind legs not enlarged for jumping	12
12a.	Front wings partly leathery; tip transparent	Stinkbug
12b.	Front wings fully shell-like	Potato Beetle

Fig. 3: Insect Diagrams





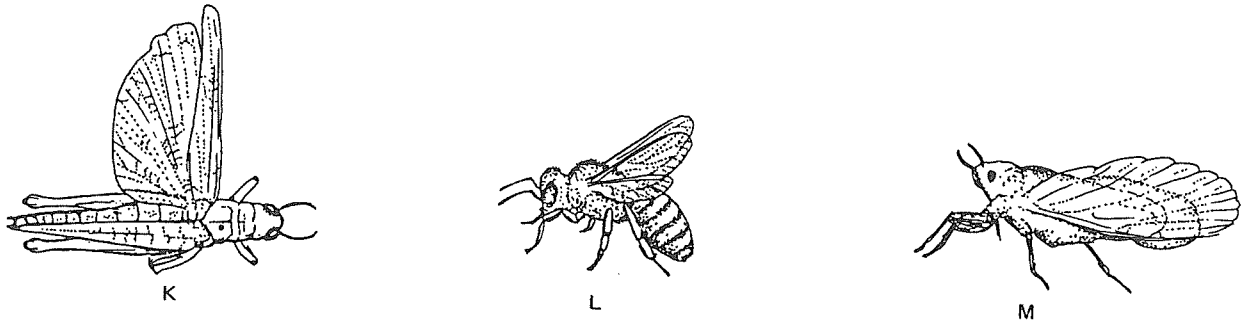
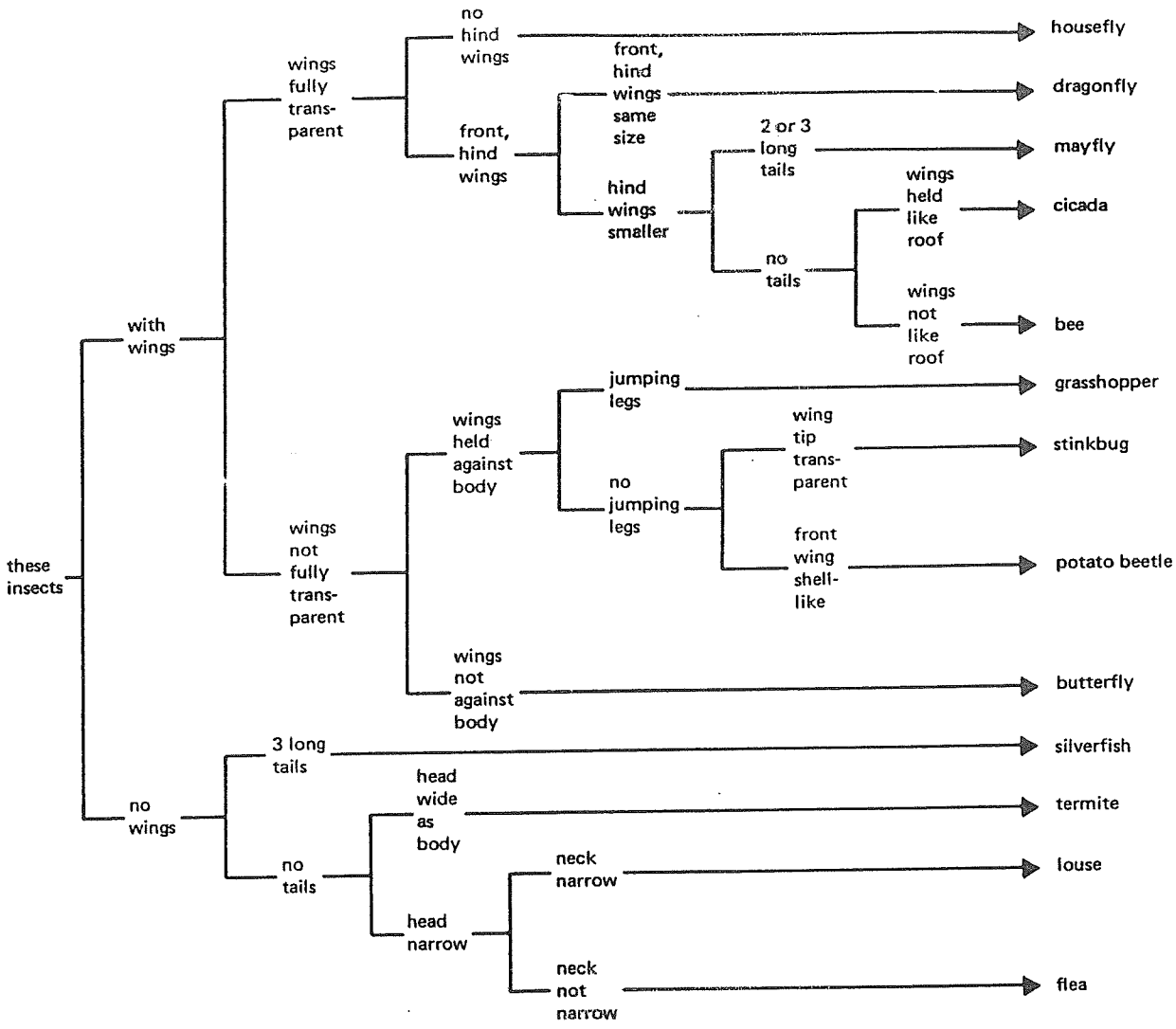


Fig. 4: Insect Identification Flowchart



Questions:

1. Is the presence of wings the only characteristic that could be used to divide the 13 insects into two groups? If no, what other characteristics in Fig. 2 could be used initially?

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2. Why is it easier to construct a flow chart, like Fig. 2, before creating an Identification Key like Fig. 1?_____

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3. What is a biological key and how is it used?_____

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4. List four different characteristics or traits that were used in the shark key:

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Conclusion: Discuss why and how we classify living organisms (3 points). Explain why we use keys in identifying biological organisms (2 points).