

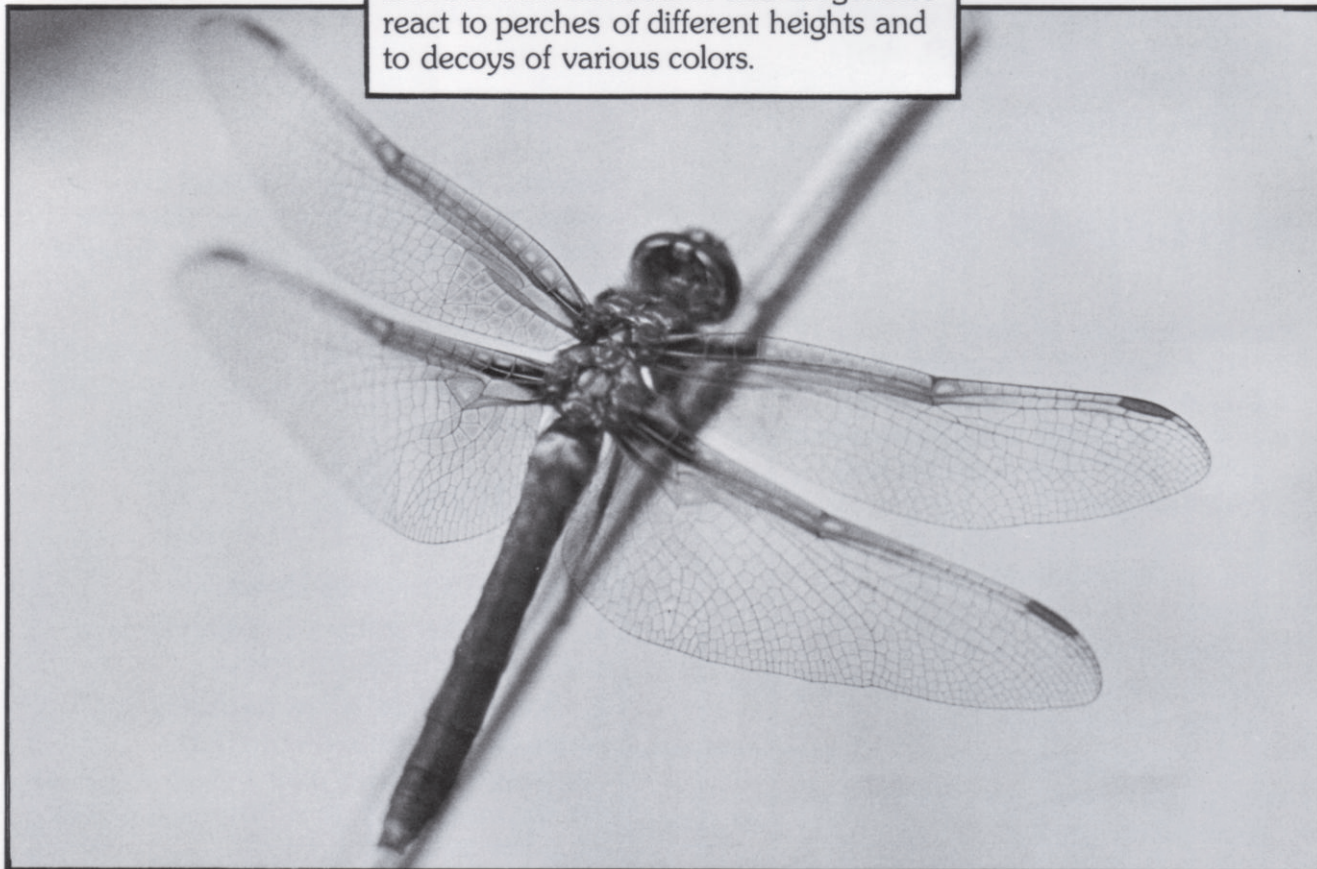
# DAMSELS AND DRAGONS

**BIO** Animal Investigation  
**KEY** Experiment  
Insect Behavior



## OVERVIEW

The youngsters conduct experiments to find out how damselflies and dragonflies react to perches of different heights and to decoys of various colors.





## BACKGROUND



The darting flight of damselflies and dragonflies is a common summer sight around pools, streams, lakes, and rivers. These brightly colored insects spend most of the day in the air or perched on reeds and other vantage points, searching for smaller flying insects for food. Their wide field of vision and outstanding aerial mobility enable them to detect and catch flying insects in midair.

Dragonflies and damselflies are swift acrobatic flyers. At rest, dragonflies look like tiny airplanes, their wings locked in a horizontal position. Damselflies look very much like dragonflies, but are smaller and slimmer. Damselflies hold their wings together above their backs when at rest, the way butterflies hold their wings.

**CHALLENGE: INVESTIGATE  
DAMSEFLY AND DRAGONFLY  
PERCHING BEHAVIOR, AND  
DISCOVER HOW THEY REACT TO  
FLYING DECOYS.**

## MATERIALS



### For each team of two:

- 12 pipe cleaners\* (15 cm long)
- 1 thin stick\* (1 to 2 meters long)
- 1 one-meter length of light monofilament fishing line\* (4 to 6 pound test)
- 12 flat toothpicks\*
- 1 Landing Record Card
- 1 Decoy Record Card
- 1 pencil

### For the group:

- 1 set of colored marking pens\* (red, blue, green, brown, and black)
- 1 roll of transparent tape\*
- extra pipe cleaners, toothpicks, and fishing line

1 sheet of Landing and Decoy Record Cards\*

scissors\*

kitchen timer\* or watch with a second hand

\* Available from Delta Education.

## PREPARATION



**Group Size.** This activity works best with groups of up to twelve youngsters.

**Time.** Plan on forty to fifty minutes for this activity. Choose a warm, calm, sunny day for the activity.

**Site.** Dragonflies and damselflies are most abundant during late spring, summer, and early fall. Choose a freshwater site with a flat, open stretch of shore line and lots of dragonflies and/or damselflies. The youngsters will have more success with this activity if the area you choose is relatively free of the reeds, bushes, and vegetation these insects naturally perch on.

**Safety.** When working around the water, use the buddy system. (See the "Safety" section of the *Leader's Survival Kit* folio.)

**Record Cards.** Make one copy of the Record Cards for each buddy team. Cut the cards apart.

## ACTION



### Part One: Perching Behavior

1. Divide the group into teams of two, and explain the buddy system.
2. Show the teams the damselfly and dragonfly illustrations in the folio. Challenge the youngsters to find some of the big insects and to watch them quietly for a few minutes.





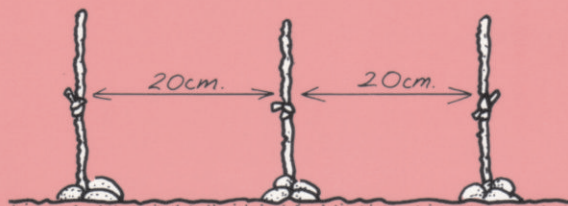
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**3.** Call the group together and ask the youngsters how the animals behave. If both dragonflies and damselflies are in the area, ask the youngsters how the two differ. Refer to the folio illustrations again to make sure everyone knows how to tell damselflies and dragonflies apart.

**4.** Ask the teams if they think damsels and dragons land on certain perches more often than they land on others. Tell the youngsters that you have brought along some pipe-cleaner perches to help them find out.

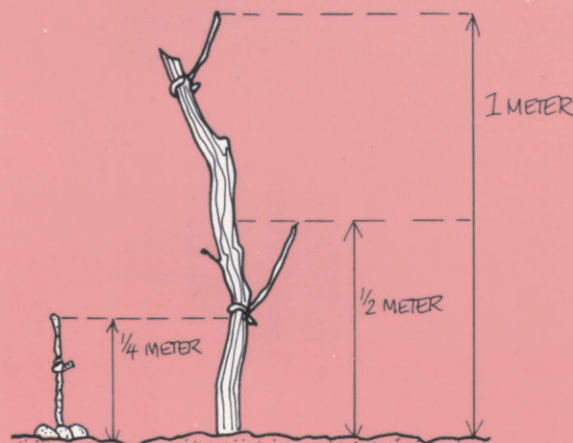
**5.** Show the youngsters how to make a pipe-cleaner perch by twisting two pipe cleaners together end-to-end. (The perches should be about 30 cm long.) Then show them how to prop the pipe-cleaner perch straight up by sticking it into the ground or bracing it with rocks near the water's edge. Explain that the tip of each perch should be at least 25 cm above the ground.



**6.** Distribute twelve pipe cleaners to each team, and ask each team to make six pipe-cleaner perches. Then have each team set up their six perches about twenty centimeters apart in an area where there are lots of dragonflies or damselflies.

**7.** Give each team a Landing Record Card and a pencil. Tell the youngsters to record a "D" whenever a dragonfly lands on a perch and a "d" whenever a damselfly lands. Suggest that the teams sit quietly two to three meters from their pipe-cleaner perches to avoid disturbing the insects.

**8.** After about ten minutes, instruct each team to remove all except their most successful perch (that is, the one with the most landings). Then have each team construct a taller double perch. Direct the youngsters to find a twig and twist the ends of two pipe-cleaner perches around it so that the top perch is about waist-high (100 cm above the ground) and the other is about knee-high (50 cm) when the stick is set into the ground. Instruct the teams to place their double perches about 20 cm from their



remaining ground-level perches.

**9.** Ask the teams to mark on the record cards the number of dragonfly and damselfly landings on each of the three pipe-cleaner perches in a ten-minute period.

**10.** Call the teams together. Ask each team to describe the height and location of their most successful perch.

## Perching Remarks



1. What was the height of the perch that dragons and damsels landed on most often?
2. What do the most successful perches have in common? How do they differ?
3. Did more than one dragon or damsel land on a pipe-cleaner perch at the same time? Were the insects all the same color? The same kind?



## Part Two: Decoy Encounters



1. Ask the kids what happens when a dragonfly or damselfly (D-fly) flies near another D-fly. Ask the youngsters what they think would happen if they moved a D-fly decoy or model near a D-fly. Tell the kids that you have some materials they can use to find out.

2. Demonstrate how to make dragon and damsel decoy rigs:

- **Damselfly.** Tie one end of a piece of fishing line around the middle of a toothpick so that the toothpick hangs level when dangled from the string. Tie the other end of the fishing line to a thin stick.
- **Dragonfly.** Use a bundle of four toothpicks taped together for a dragonfly decoy. Tie the other end of the line to a thin stick.

3. Hand out the marking pens and toothpicks, and ask the teams to color enough toothpicks so that each team ends up with five different-colored decoys (red, blue, green, brown, and black).

4. While the group watches, pick up a decoy rig and demonstrate a quiet, slow approach to a perched D-fly. "Fly" your decoy by the D-fly several times, getting as close as you can to the D-fly. Tell the kids to watch carefully what the D-fly does.

5. Give each team a Decoy Record Card, and challenge the teams to "fly" each colored decoy near a D-fly for one minute and to record the D-fly responses on the card. The leader can call out the time for the flights. The team members can trade decoy-flying and recording duties. However, each flight of a decoy should be similar to all other flights. The only thing that should be different is the *color* of the decoy.

6. Join in the fun yourself. Call the teams together when you have finished.

## Decoy Discoveries

1. Did the decoy color seem to make any difference? What colors got the most and the strongest responses?

2. Why do you think dragons or damsels responded to your decoys the way that they did?

3. Explain that many animals, such as dogs, cats, and many birds, mark out certain areas and defend them against other animals of the same kind.

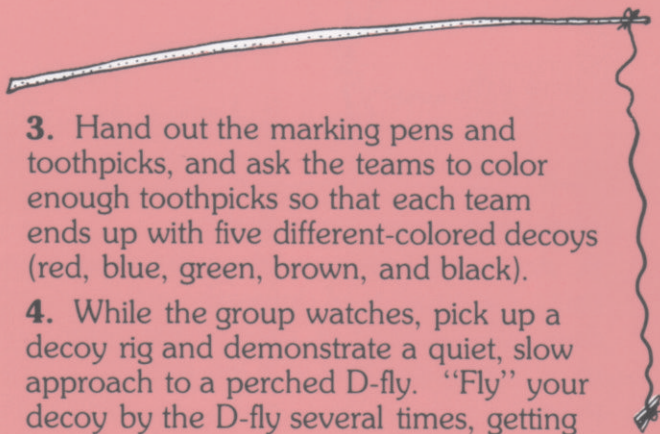
Biologists call these areas **territories**. Ask the kids if they think dragonflies and damselflies have territories. Ask about people. Ask the kids to explain their answers.

## BRANCHING OUT



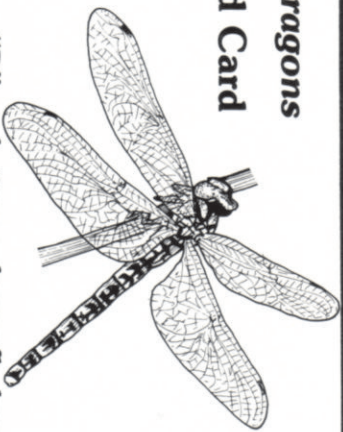
1. Try to get close enough to a dragonfly to watch it breathe. The tail (abdomen) swells up when the dragonfly draws in air and shrinks when it expels air. Compare the dragonfly's breathing rate with your own.

2. Suggest that the youngsters make and set up pipe-cleaner perches of different colors to find out if dragonflies and damselflies land on one color of perch more often than on perches of other colors.





## Damselfly Landing Record Card



**Perch Number** Mark a "D" each time a dragonfly lands.  
Mark a "d" each time a damselfly lands.

1	
2	
3	
4	
5	
6	

**Perch Height** Mark a "D" each time a dragonfly lands.  
Mark a "d" each time a damselfly lands.

Low	
Middle	
High	

## Damselfly Decoy Record Card



**Decoy Color** Use "D" to indicate dragonfly.  
Use "d" to indicate damselfly.  
What did the damselfly and dragonfly do?

Plain	
Red	
Blue	
Green	
Brown	
Black	