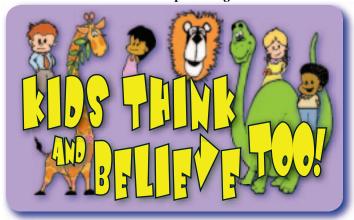
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THOSE AMAZING FROGS *

by Lanny and Marilyn Johnson

Early this spring, I saw several of our "pet frogs" sitting by our irrigation pond that had recently filled with water. They had survived another cold winter. Have you ever asked yourself, where frogs go in the winter? As we look into how they survive harsh, freezing conditions, we see how God has provided for the needs of His creatures.

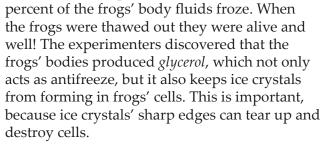
Because frogs don't make their own body heat, they are considered cold-blooded. They depend on other sources of heat to keep warm – the heat of the water or air around them and the heat of the sun. As winter approaches and the temperatures begin to cool, a frog's blood begins to gets thicker and its body starts to slow down.

The start of cooler weather also causes the frog to begin looking for a place to sleep (hibernate) during the coming winter. This place of rest is carefully chosen for warmth. If the frog's body temperature drops more than two degrees below the freezing point of water, ice crystals will begin to build in its blood, and the frog will die. Some frogs may dig down and burrow beneath the leaves on a forest floor or

crawl into rotting logs, using the heat from the decaying plant material to help keep warm. Others may bury themselves deep in mud to get away from the freezing winter temperatures.

In some climates, the winters are so

cold that even frogs
that are covered
by plant material
or mud will freeze.
Yet some northern
tree frogs are able to
survive these cold
temperatures. Scientists
have experimented
with some tree frogs
by cooling them down
several degrees below
freezing. The scientists
discovered that up to 35



The Wood Frog lives where it gets so cold that its body makes an even more powerful antifreeze than glycerol ... it makes *glucose*. The amount of glucose Wood Frogs make is powerful enough that it would cause cell damage in other frogs; however, the Wood Frog has another special design to help it survive. It is able to keep its cells from being destroyed by slowing its body down so much that they actually become brain-dead. Surprisingly, if the Wood Frog's cells are damaged by ice crystals, its blood has special proteins called *fibrinogens* that fix the cell walls by sealing any leaks.

God provided frogs with another design

to help them survive. Sometimes it can be very cool during the spring or summer. Conditions like this can kill a lot of frogs. Amazingly, the surviving frogs lay eggs that have more females than males! Having more females means having more eggs, which means having more

frogs, which means the frog population has a better chance of quickly returning to normal.

Could frogs have come up with any of these survival skills and designs on their own? Could chance and accidents (evolution) ever make wonderful abilities such as these? Think about this ... how many times would a frog have to die before it

developed all of these ways to survive? Once you are dead you don't get a chance to go back and fix your mistakes! Only an intelligent Creator could provide for wonderful designs such as these.

GREY TREE FROG

Wow! Now think - if God cares this much for frogs, just think of how much more He cares us!



*Much of this information was derived from different Creation Moments programs http://www.creationmoments.

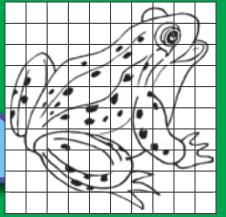


WORDSEARCH

Look for the words from the WORD LIST below. The hidden word might be up, down, sideways or slanted, but not backwards.

ANTIFREEZE FIX ICE **BURROW FREEZING** LEAVES COLDBLOODED FROG LOGS COOL **GLUCOSE** MUD **CRYSTALS GLYCEROL** WARM DIG HEAT WEATHER **FIBRINOGENS WINTER** HIBERNATE

FOR ANSWERS GO TO: http://
NewsletterAnswers.htm



Draw the frog in the grid above.
When you are finished you can give the frog some color.

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