

Secrets of Noah’s Ark

Handout for Class 3: The Ark and Its Passengers

A. The Weight of the Ark & the Weight of Its Contents (Animals, People, Food, Waste):

Gen. 7:20 says that the height of the water above the mountains was 15 cubits. Gen. 8:3-5 gives the rate (cubits per day) that the waters subsided, and the time (days) it took for the Ark to land on a mountain top. From this, Rashi on Gen. 8:4-5 explains how to calculate the height of the Ark that was under water (11 cubits). From the volume of the Ark that was underwater ($300 \times 50 \times 11$ cubits³), we know the volume of water that was displaced: 1,643,299.22 ft³. From this we get the weight of the water that was displaced (using the density of fresh water, 62.4 pounds per ft³, since the rain and opened underground reservoirs that increased the sea level were fresh water). From Archimedes' Principle, that is equal to the weight of the Ark with all its contents. (Archimedes' Principle is that the upward buoyant force that is exerted on a body immersed in a fluid, whether fully or partially submerged, is equal to the weight of the fluid that the body displaces.) This weight for the full Ark is 102,541,871.32 pounds = 46,512,210.4 kg.

To find the weight of the Ark's contents, subtract from this the weight of the wooden structure of the Ark. The exact species of tree which the Hebrew verse calls "gopher" is not known, but it was likely a type of cedar. The engineering analysis by Joseph Silver assumes a wood density of 28 pounds per ft³, and estimates the volume of wood to be 1,132,053 ft³, corresponding to 31,697,484 pounds. Thus the weight of the animals, people, food, waste, and anything else (see below!) was ~ 70,844 pounds = 32,134.5 kg.

B. The Food Supply for the Animals

Evidence #1: When Noah was born, he was prophetically described by his father Lamech as the one who "will bring us rest from our work and from the toil of our hands, from the ground which G-d has cursed." (G-d had cursed the people's crops beginning in the generation of Enosh, as another punishment for idolatry which they started to practice at that time.) **Noah became a revolutionary expert in farming tools and techniques.**

Evidence #2: After the Flood, Noah took grape vines which he had saved for a year on the Ark and planted a vineyard. **The vines had to be planted while they were in the Ark.**

Evidence #3: Why were the many thousands of animals on the Ark put only on the middle deck, but the upper deck which was the same size, was reserved for only eight people? **There must have been something else taking up almost all the space on the top deck.**

Evidence #4: G-d told Noah to make a light in the Ark's roof. It was either a clear window or a luminescent crystal, and **it provided light for the upper deck** (and for the 2nd deck).

Evidence #5: The walls of the Ark were sealed with pitch inside and outside, and the top deck would be cooler than the bottom which contained the waste. Thus, moisture would rise to the top and condense into water. **The Ark therefore functioned as a greenhouse.**

Conclusion: The top deck could have been filled with a 6-inch layer of soil in which crops were planted to provide food for the animals and people for the year in the Ark. Mr. Silver's self-consistent calculation shows that this could have sustained ~ 36,000 animals.