Onboard the Ark, the first four signs displayed are not included in the book, *Ark Signs*, but the question posed above is answered by them. Visuals of each sign are posted online. Here is how they read:

> **WHAT DID THE ARK LOOK LIKE?** The Bible provides few details about the Ark (e.g., dimensions, three decks, coated inside and outside by pitch), but it does not explain every aspect needed for us to recreate an exact replica. Our Ark is based on the biblical data and shipbuilding research, but we used artistic license in many areas, including the design of the ship's interior and exterior structure as well as the mechanisms for animal feeding and waste removal.
>
> **IS THE ARK ENCOUNTER ADDING TO SCRIPTURE?** Details like naming the women enhance the overall guest experience, and they should not in any way be considered attempts to add our ideas to the Bible. Additional signage can be found in exhibits containing significant amounts of artistic license to help visitors discern between Scripture and elements of artistic license.
>
> **Who Was Noah's Wife?** The Bible gives some specifics about Noah (e.g., righteous man, husband, father), but it does not tell us what he looked like, how he dressed, or what his hobbies might have been. We are told even less about his family, and Scripture does not even reveal the names of his wife and his daughters-in-law. Artistic license was taken to name these four women, develop their backstories, and craft their appearances.
>
> **Research-Based Enhancements.** To design the Ark and many of its exhibits, the Ark Encounter necessarily used some artistic license to fill in information the Bible does not mention. To minimize the amount of license, these extra details were often based upon research of ancient history, from hair and clothing styles to exhibit and ship design.

About Those Critters

Questions arise regarding the number of creatures to be brought onboard. Research was done on the three categories of taxonomy described in Scripture and less than 7,000 were discovered.

Space for that many occupants had to be researched, plus storage for a year-long inventory of food for each.

Some question whether Noah and his sons knew how to build a vessel of this size. Yet Genesis 6:14*a* begins with the command, "Make for yourself an ark." The knowledge, talent, and ability to fulfill that commandment were obviously possessed by all four men since God would not have commanded them to do what they were incapable of accomplishing.

For the architects and crew of Ark Encounter to accomplish the task in the twenty-first century required of them to do some research. Does the Bible provide any insight into resolving that question? Here is an excerpt from, *Inside Noah's Ark: Why It Worked*:

> The Ark Encounter team relied on the scant clues found in Scripture: "Zillah gave birth to Tubal-cain, the forger of all implements of bronze and iron" (Genesis 4:22*a*). (p. 9)

Numerous writers over the course of New Testament history have done calculations on the possibility of housing the beasts, persons, food, water, and means of waste disposal on a vessel of the size described in Scripture. They include the writings of Josephus (37–100), Origen (184–253), St. Augustine (354–430), Bishop John Wilkins (1614–1672), and Athanasius Kircher (1602–1680). Kircher's research is worth noting:

> Anthanasius Kircher collected and shared his research on the biblical account in his book, *Arca Noë*. These included his calculations on the vessel's dimensions. The main focus here is not the Flood, but the vessel. Working its structure out, even to the minutest detail, was a way of making the fundamental laws that govern everything explicit. His reason for giving such a detailed account was not to provide the reader with useful information, but rather to show that everything is consistent. As Kircher explains, Noah was just the fabricator of the Ark; God Himself was the architect. Indeed, God went so far as to instill into Noah the knowledge of how to construct the Ark.[5]

(End JAS3-27. See JAS3-28 for continuation of study at p. 271.)

[5] Olaf Breidback and Michael T. Ghiselin, "Athanasius Kircher," in *Inside Noah's Ark*, 13.

Some critics argue that the ark could not have held all the various species that existed at the time of the flood. Ham logically addresses this question. He distinguishes between "kinds," and "species." Here is an excerpt that provides his rationale:

> **Species or Kinds?** Though wild animals today are often considered according to their *species*, the Bible deals with animals according to their *min*–[מִין **(*miyn*): Genus *Canis*]–a common Hebrew word usually translated "*kind*." We can infer from Scripture that God created plants and animals to reproduce after their *kinds* (Genesis 1:11–25), and it is clear from various texts that a *kind*, or *Genus*, is often a broader category than the current concept of a *species*.

Note: In Genesis 1, the text uses the phrase "after their kind" regarding "fruit trees" (vv. 11–12) and "living creatures after their kind: cattle and creeping things and beasts of the earth after their kind. God made the beasts of the earth after their kind, and everything that creeps on the ground after their kind" (vv. 24–25).

> This means that a *kind* may contain many different species. Since Noah was only sent to select representatives from relevant *kinds*, all land-dwelling vertebrate species, not present on the Ark, were wiped out. Therefore, if we see an Ark *kind* represented today by different *species*–e.g. horses, zebras, and donkeys of the equid kind–those *species* have developed since the time of the Flood. Therefore, *species* are simply varying expressions of a particular *kind* **[or *Genus*]**.[1]

To better understand Ham's designations of "kinds" and "species," we need to go back to the *Encyclopaedia Britannica* and note its paragraph on:

> **The Taxonomic Process.** Basically, no special theory lies behind modern taxonomic methods. In effect, taxonomic methods depend on: **(1)** obtaining a suitable specimen; **(2)** comparing the specimen with the known range of variation of living things;

[1] Tim Chaffey, "How Many Animals Were in the Ark?" *Inside Noah's Ark: Why It Worked*, gen. ed. Laura Welch (Green Forest, Ark., Master Books, 2016), 17.

> **(3)** correctly identifying the specimen, **(4)** determining the best position for the specimen in existing classifications. *Ranks*. The goal of classifying is to place an organism into an already existing group.[2]

The example given in the above article reveals the zoological hierarchy in the **Kingdom** Animalia: The **Kind** or **Genus** is ***Canis***: **dog**, the **species** is ***Canis lupus***: **wolf**, and the **Subspecies** is ***Canis lupus occidentalis***: **northern timber wolf**. Therefore, there are numerous "Kinds" or "Genera" of "dogs," one of which is the *Canis lupus occidentalis*, "northern timber wolf."

In Ham's analysis, he asserts that Noah only needed to take onboard seven pairs of dogs. These kinds would produce various species over the course of world history up to the present hour. This was the case with all the other **Kingdom** *Animalia* the Lord specified to be taken onboard.

With this system understood, Ham's Ark Encounter team projected that of the four categories of amphibians, reptiles, mammals, and birds, Noah would be required to take less than 7,000 kinds onboard.

The accommodations for this many creatures would require space on all three decks of the Ark. These enclosures are on display throughout the three levels.

About Those Groceries

Prior to the Flood, mankind was not allowed to eat the flesh of living creatures since they were to be strict vegetarians:

> **Genesis 1:29** God said, "Behold, I have given you every plant yielding seed that is on the surface of all the earth, and every tree which has fruit yielding seed; it shall be food for you;
>
> **v. 30** and to every beast of the earth and to every bird of the sky and to everything moves on the earth that has life, I have given every green plant for food"; and it was so.

This menu was in force until after the Flood. Therefore, all people and all God's critters were only allowed to eat vegetables. Therefore, everyone was restricted to grains, grasses, seeds, fruits, and nuts.

[2] Arthur K. Solomon, "Taxonomy," in *The New Encyclopaedia Britannica: Macropaedia* (2019), 14:1090.

A system of storing food had to be devised. The research by the Ark Encounter staff opted for a system that had been proved successful from recent history but certainly applicable for Noah's application on the Ark:

> The designs of the water and food storage vessels are based on a re-occurring design that we see throughout history. This design shows up in various cultures from Greece to China at different times because it works well for shipping goods. These vessels are made from a material that is readily available—clay.
>
> Based on the projected number of animals and their calculated food needs at 80 percent dry matter along with a 50 percent contingency for spoilage, the hypothetical layout contains nearly 15,000 earthen vessels, each with a volume of 1.75 cubic feet.

About the Supply of Fresh Water

Although water would be everywhere, there would not be a drop to drink. This required a water supply, water storage, and water distribution. Obviously, this had to be thought out, but keep in mind that the Lord is on hand to offer an abundance of divine provision by means of the unrelenting rain.

The Ark Encounter experts thought through the development of a water-filtering system for preservation of a water supply:

> Two potential solutions were considered: **(1) Carry:** The Ark carried all of the required water on board to meet the needs of the animals and people during the time on board, which was approximately one year. **(2) Collect**: The Ark carried or stored large quantities of water in cisterns on board but required secondary means to regularly replenish these tanks. As we explore each premise, it will become clear why the Ark Encounter chose the second option.
>
> **Carry.** In his feasibility study of the Ark, John Woodmorappe calculated the amount of water for approximately 16,000 animals. He assumed all water had to be carried on board and concluded that over 1 million gallons would be needed. The storage of this amount of water would take up slightly less than 10 percent of the volume of the Ark.

> However, even if Woodmorappe's calculations are fairly accurate, the Ark Encounter team identified two problems with this approach. First, it would be extremely difficult to prevent the contamination of so much standing water over the course of a year—the contamination of the water source would be catastrophic.
>
> Second, this method goes against one of the basic assumptions made by the Ark Encounter team. They assumed that God did not tell Noah how long they would be on the Ark. This unknown creates another variable that could have been eliminated by utilizing a different system for obtaining water.

The Ark's architects had given forethought to water storage and distribution and the ability to capture rainwater resolved the problems related to the "Carry" solution discussed above.

> **Collect**. Cisterns were already designed to occupy the second and third decks along each side of the ship, not far from the animal pens and enclosures. There are also many sealed earthen vessels on the first deck that hold a two-month supply of potable water. The cistern design is meant to utilize rainfall during the Flood to provide the required amounts of water.
>
> This series of cisterns with a reliable dispersion system could have stored all of the water necessary for the Ark's occupants without additional water storage as cargo.
>
> One inch of water collected on the Ark's roof would have filled nearly one week's worth of water needs. To prevent overflowing the cisterns due to excess rain, a series of valves and spigots could have been used to shut off the flow of water from the Ark's roof.[3]

It is from these systems that occupancy onboard the Ark was possible to manage. There are numerous other details that the Ark Encounter architects designed for this twenty-first century Ark.

[3] Chaffey, "How Could the Water Be Stored?" in *Inside Noah's Ark*, 29–30.

The laws of higher math and reliance on faith in God led them to construct a ship without a motor, without sails, without a rudder, and without a crew. Everyone who went onboard—man and beast—were along for the ride.

There is one more aspect that the present designers of the Kentucky Ark incorporated into the vessel. I include it under the principle of "hydrodynamics, the branch of physics that deals with the motion of fluids and the forces acting on solid bodies immersed in fluids."

God created the universe using His mathematics to accomplish the feat in a microsecond. Man has discovered many applications of His laws that have been the same since the creation. I offer this final insight into our overview of the Ark. It may or may not have been a part of Noah's design, but it was among the options he had available to him:

A Hole in the Ship?

> An important component that has been proposed as part of the Ark design—the concept of a moon pool. What is a moon pool? Well, picture a ship with a hole in the bottom of the hull and a wall surrounding the hole all the way up through the top deck—in the Ark's case, the roof. Water won't enter the ship because it's contained inside the moon pool's walls, moving up and down like a piston as the ship rides the waves.
>
> The Ark Encounter designers have placed two moon pools in the stern, straddling the keel. These moon pools are capped-off vertical shafts running the height of the Ark. These shafts are open at the bottom, permitting a relatively free flow of water within the interior. One moon pool is used for ventilation, as the in-and-out movement of the water acts like a massive bellow, circulating air throughout the Ark.
>
> One moon pool is an integral part of the waste removal system on the Ark.[4]

[4] The excerpts cited above are taken from the book, *Inside Noah's Ark: Why It Worked* by Tim Chaffey and edited by Laura Welch. © 2016 by Answers in Genesis–USA. All right reserved.