Grade 4-6 & 7-8 Skills Ontario Challenge 2021

"Ferris Wheel"

The Challenge

Using your LEGO set, motor and battery box, your team has to design and build a Ferris Wheel of your own design and it must meet the following specifications:

- Your Ferris Wheel must be 40cm in diameter
- Your Ferris Wheel must have a minimum of 6 passenger cars or cabins for carrying 2 Lego people each
- Scoring will be based on Sketches, Team Work, Design and that it can meet the task that it is supposed to.

What is a Ferris Wheel?

A Ferris wheel (or a big wheel in the United Kingdom) is an amusement ride consisting of a rotating upright wheel with multiple passenger-carrying components (commonly referred to as passenger cars, cabins, tubs, capsules, gondolas, or pods) attached to the rim in such a way that as the wheel turns, they are kept upright, usually by gravity.

History


17th Century Turkish 'Ups-and-Downs'

"Pleasure wheels", whose passengers rode in chairs suspended from large wooden rings turned by strong men, may have originated in 17th-century Bulgaria.

The original Ferris Wheel, sometimes also referred to as the Chicago Wheel. However, the very first in operation Ferris wheel was actually at the New York State fair in 1894. Created by two Erie Canal workers was designed and constructed by Ferris Jr.

With a height of 80.4 metres (264 ft) it was the tallest attraction at the World's Columbian Exposition in Chicago, Illinois, where it opened to the public on June 21, 1893. It was intended to rival the 324-metre (1,063 ft) Eiffel Tower, the center piece of the 1889 Paris Exposition.

There were 36 cars, each fitted with 40 revolving chairs and able to accommodate up to 60 people, giving a total capacity of 2,160. The wheel carried some 38,000 passengers daily and took 20 minutes to complete two revolutions, the first involving six stops to

allow passengers to exit and enter and the second a nine-minute non-stop rotation, for which the ticket holder paid 50 cents.

Variants

Observation Wheels

Observation wheel is an alternative name f or Ferris wheel. In 1892, when the incorporation papers for the Ferris Wheel Company (constructors of the original 1893 Chicago Ferris Wheel) were filed, the purpose of the company was stated as: [construction and operation of] "...wheels of the Ferris or other types for the purpose of observation or amusement".

Wheels with passenger cars mounted external to the rim and independently rotated by electric motors, as opposed to wheels with cars suspended from the rim and kept upright by gravity, are those most commonly referred to as observation wheels, and their cars are often referred to as capsules. However, these alternative names are also sometimes used for wheels with conventional gravity-oriented cars.

Centreless Wheels

In the centreless (sometimes called hubless or spokeless) wheel design, there is no central hub and the rim of the wheel stays fixed in place. Instead, each car travels around the circumference of the rim. The first centreless wheel built was the Big O at Tokyo Dome City in Japan. Its 60-

metre (197 ft) height has since been surpassed by the 145-metre (475.7 ft) high Bailang River Bridge Ferris Wheel on the upper deck of the Bailang River Bridge in Shandong Province, China, which opened in 2017.

Transportable wheels

Transportable Ferris wheels are designed to be operated at multiple locations, as opposed to fixed wheels which are usually intended for permanent installation. Small transportable designs may be permanently mounted on trailers, and can be moved intact. Larger transportable wheels are designed to be repeatedly dismantled and rebuilt, some using water ballast instead of the permanent foundations of their fixed counterparts.

Double and Triple Wheels

A double Ferris wheel designed to include a horizontal turntable was patented in 1939 by John F. Courtney, working for Velare & Courtney. In Courtney's design, there were two independent Ferris wheels, each rotating at either end of a cantilever arm. The cantilever arm was supported in the middle by a tall vertical support, and the cantilever arm itself rotated around its middle pivot point.

A triple variant was custom designed for the Marriott Corporation and debuted at both Marriott's Great America parks (now Six Flags Great America, Gurnee,

Illinois, and California's Great America, Santa Clara) in 1976 as Sky Whirl. Each ride had three main components: the three spiders/wheels with their passenger cars; the triple-spoked supporting arm; and the single central supporting column. Each wheel rotated about one of the three ends of the supporting arm. The supporting arm would in turn rotate around its central hub as a single unit about the top of the supporting column.