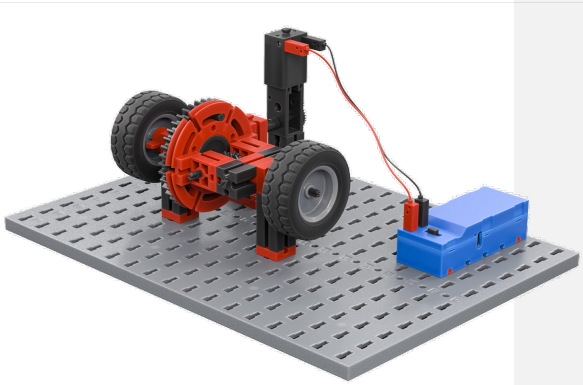
Model 7
Differential gear



Date

Name

Class

Without a differential gear, no car could drive around a tight corner—it allows the wheels of a driven rigid axle to rotate at different speeds.

DESIGN TASK

A special type of planetary gear is the differential gear: it is a planetary gear made of bevel gears.

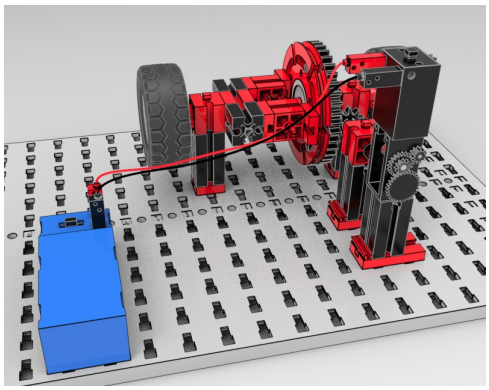
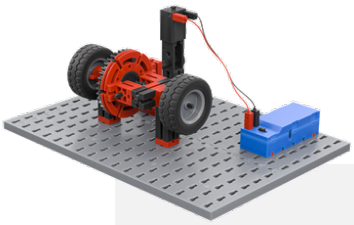


Fig. 1: Differential gear

Design the differential shown in Fig. 1.

What happens when a vehicle driven by a differential gear like this takes a tight corner?



THEMATIC TASK

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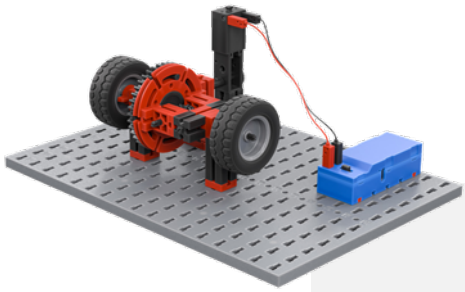
1. What change in motion does the differential gear achieve?

2. Simulate a wheel locking up (e.g., when braking) by holding it down. Describe what happens.



EXPERIMENTAL TASK

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1. What happens when one of the wheels spins, e.g., on sandy ground or on ice?

2. As a measure against spinning wheels, off-road vehicles have a "differential lock" that effectively "bridges" the differential. How could you add something like this to your differential gear?