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The period of a pendulum does not change with the speed of the pendulum bob

You can measure angle from GlideWheel-AS at small intervals.
Also the GlideWheel-AS has very little internal friction.

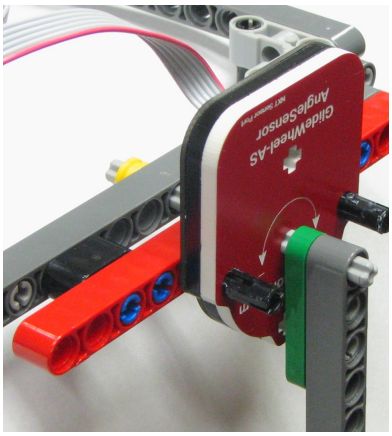
You can use these properties to create a data collecting, low friction pendulum system where a GlideWheel-AS is mounted at the pivot point.

Design a program (or use NXT-G data logging tool) for your NXT to log Angle readings at short and fixed intervals.

Period of pendulum will be the time it takes for the angle readings to swing to other end and restore.

Measure the time taken by your pendulum while is swinging at various speeds.

Adjacent pictures show how a simple assembly would be created.



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The period of a pendulum is proportional to the square root of its length

You can measure angle from GlideWheel-AS at small intervals.
Also the GlideWheel-AS has very little internal friction.

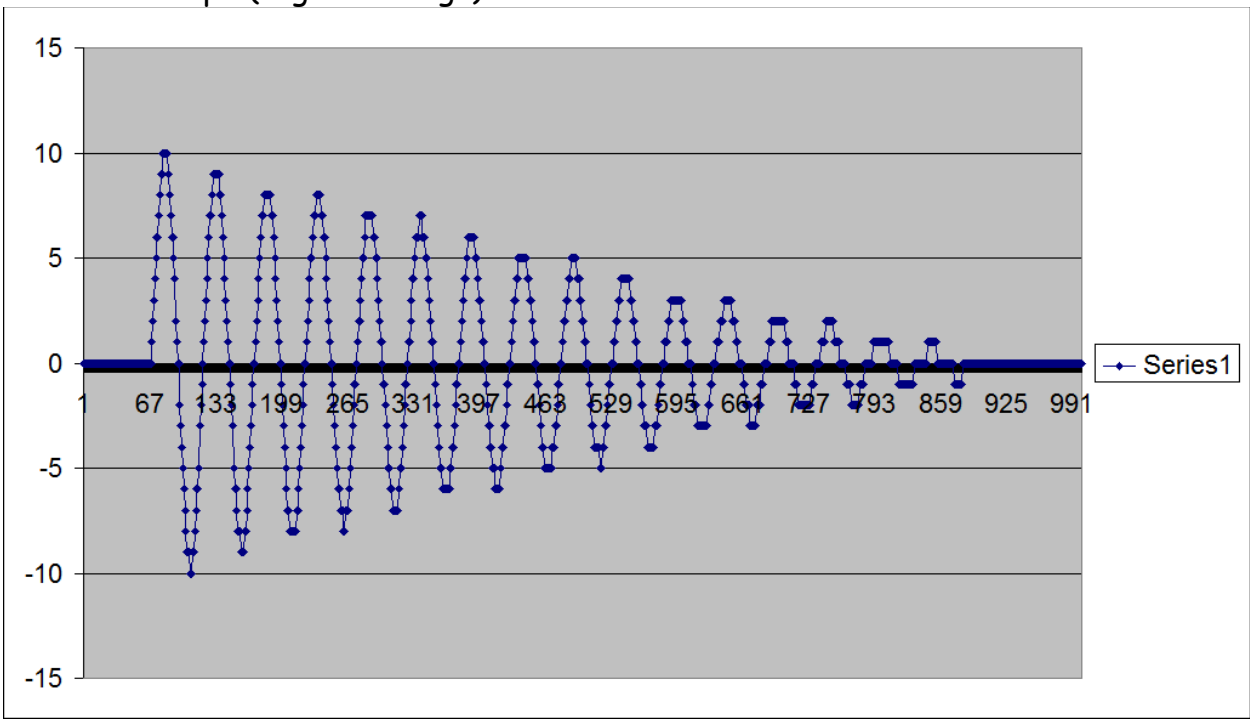
You can use these properties to create a data collecting, low friction pendulum system where a GlideWheel-AS is mounted at the pivot point.

Design a program (or use NXT-G data logging tool) for your NXT to log Angle readings at short and fixed intervals for differing lengths of pendulums.

Period of pendulum will be the time it takes for the angle readings to swing to other end and restore.

Make a note of the period with respective length of pendulum.

Pendulum Graph (angle readings):



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Compute internal friction of the pendulum

Compute internal friction using decaying amplitude of Simple harmonic motion of the pendulum

A practical pendulum system encounters resistance and friction resulting in energy loss. (read more: http://en.wikipedia.org/wiki/Q_factor)
This energy loss causes the amplitude to decay, and eventually stop the motion.
A pendulum with heavier bob will stay in motion longer than the one with lighter weight.

Using these principles you can compute the Q factor of your pendulum system.

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Measure and display bicycle speed

The Angle Sensor can measure RPM (revolutions per minute).

Design a LEGO contraption of Angle Sensor for your bicycle and mount it like a dynamo (use a LEGO wheel with tire that will touch your bike-tire).

Compute the circumference of your bike-tire and circumference of your LEGO-tire.

Compute the ratio of Angle Sensor RPM to wheel rotations, and use these parameters to calculate the bike speed.

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Relation between motor power and motor RPM

Generally, as the power applied to a motor increases, its RPM also increases.

Design a LEGO contraption of Angle Sensor and a NXT motor such that you can vary the power applied to the NXT motor, and measure the RPM reported by Angle Sensor.

Increase the power applied to motor at every 10 seconds interval from 0 to 100.
Record this power applied and RPM measured from the Angle Sensor.
Make a Line Chart of this data using Excel.

What relation can you establish between the motor power and motor RPM?

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