

## THE MATH AND SCIENCE OF TIDES

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### **Description:**

Using Puntarenas tidal data, we will discover some interesting patterns. Then we will make a simple model to help explain some of the mysteries of the tides.

### **Activities:**

Graphing Tidal Data

Building Tide Model to Answer Questions About the Tides

### ***I. Graphing Tidal Data***

#### **Materials:**

Tide data for your local area from the internet.

Tidal data for Puntarenas is available at:

<http://www.imn.ac.cr/>

This web page also has data for other parts of Costa Rica.

Graph paper

Pencil

#### **To Do and Notice:**

Graph the data for at least 9 days: place points on the graph for the high and low tides, as well as for the times they occur.

Draw a smooth curve connecting the points.

Tape the graphs together, in order of the dates to create a continuous smooth curve of tidal data.

What do you notice?

### ***II. Build Tide Model***

*We are going to build a simple device that will answer the following questions:*

- 1. Why are there two high tides per day?*
- 2. Why does the tide arrive later each day?*

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### 3. Why do the tides change height during a month?

How to build the tide model, and scientific explanations are on the following web page.

<http://www.exo.net/~pauld/activities/tides/tides.html>

Paul Doherty is a physicist, and one of the senior scientists at the Exploratorium.

#### **Tablas Mareas de Puntarenas, Marzo, 2006**

**Data de Tablas Mareas:** <http://www.imn.ac.cr/>

<b>Fecha</b>	<b>Hora</b>	<b>Altura en Pies</b>
Miercoles	01:19	01,32
22 de marzo	07:40	07,06
	13:31	01,87
	19:59	07,71
Jueves	02:14	01,71
	08:39	06,80
	14:33	02,14
	21:02	07,48
Viernes	03:24	01,91
	09:50	06,80
	15:48	02,20
	22:16	07,45
Sabado	04:42	01,78
	11:04	07,19
	17:08	01,94
	23:31	07,75
Domingo	05:52	01,28
	12:12	07,88
	18:21	01,32
Lunes	00:38	08,24
	06:51	00,59
	13:12	08,76
	19:21	00,50

Martes 28	01:37	08,83
	07:43	-00,06
	14:04	09,58
	20:13	-00,26
Miercoles 29	02:29	09,35
	08:30	-00,59
	14:52	10,21
	21:02	-00,85
Jueves 30	03:18	09,65
	09:15	-00,88
	15:38	10,54
	21:47	-01,14