Working Scientifically:

How do the phases of the moon affect tide levels?

Comparing tide levels at various phases of the moon.
Constructing line graphs.
Analysing and interpreting data.

- Work in groups of four.

- Each person is responsible for creating a line graph.

- Work together to analyse and interpret the results.

Interpreting Data Activity

1) Examine data for a given location: Gladstone, Queensland, Australia.

2) Plot the water level measurements for each of the highlighted days on the chart. (Peak times for each phase of the moon.)

3) Form a line graph for each phase of the moon.

4) Compare the graphs. What differences or similarities can you see?

5) Formulate an answer to the question: How do the phases of the moon affect tide levels?

Gladstone is located on the central coast of Queensland, Australia. The city is known for its deep water harbour and port facilities.

Gladstone, Queensland, Australia. Tide Levels for January 2016

24 Hour Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Fri 1/1/16	280	299	302	283	249	213	188	176	177	195	228	269	306	333	341	326	289	239	194	162	148	154	180	214
Sat 2/1/16	248	277	296	299	286	260	230	207	192	187	198	225	259	294	320	326	312	280	236	194	165	151	155	178
Sun 3/1/16	210	245	277	299	308	301	278	248	220	197	184	189	213	248	284	311	319	309	279	236	194	162	145	149
Mon 4/1/16	172	206	246	284	314	328	322	296	260	222	190	170	174	201	241	280	309	320	312	281	234	187	150	132
Tue 5/1/16	138	166	208	256	302	337	353	342	307	260	213	172	151	159	194	240	283	315	328	318	279	225	172	132
Wed 6/1/16	116	129	168	220	275	328	366	377	354	306	250	194	149	131	150	196	247	293	326	338	320	270	207	150
Thu 7/1/16	111	101	126	179	240	303	359	394	393	354	295	231	171	125	115	150	205	260	307	340	346	314	252	184

24 Hour Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Fri 8/1/16	126	92	92	133	199	267	335	390	416	398	344	276	209	145	102	108	159	221	278	324	353	347	300	228
Sat 9/1/16	158	103	76	90	151	226	299	368	417	427	391	326	254	183	119	85	110	174	240	298	343	363	342	280
Sun10/1/16	201	133	83	66	100	176	256	332	397	435	428	377	303	229	157	94	76	122	193	260	318	359	366	329
Mon11/1/16	256	176	112	70	66	120	205	285	360	419	443	418	356	278	204	131	77	80	140	212	279	336	369	362
Tue 12/1/16	311	232	155	98	65	79	149	234	312	382	430	438	400	330	252	179	110	70	94	161	231	296	348	372
Wed13/1/16	352	291	211	142	94	73	103	179	259	331	393	429	423	376	303	226	158	99	77	114	181	248	309	354
Thu 14/1/16	368	338	273	198	139	100	91	131	204	276	341	391	416	401	350	276	205	144	98	91	134	197	260	315

24 Hour Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Fri 15/1/16	353	359	327	264	197	147	117	116	155	219	283	338	379	396	377	326	256	192	140	105	107	147	206	265
Sat 16/1/16	314	348	353	323	267	209	165	139	138	169	221	277	324	360	373	357	309	247	189	144	115	117	152	206
Sun17/1/16	262	309	344	353	331	284	232	189	161	151	169	210	259	303	338	354	343	304	249	194	151	122	118	147
Mon18/1/16	198	253	304	344	363	351	311	259	212	175	153	157	189	236	281	319	341	339	309	258	202	155	122	112
Tue 19/1/16	135	185	245	304	353	380	376	340	284	227	179	145	137	165	214	264	308	336	342	319	268	206	154	116
Wed20/1/16	100	121	176	243	311	368	402	401	363	299	233	175	130	116	146	200	256	305	339	351	328	271	203	146
Thu 21/1/16	105	87	112	175	250	327	389	424	419	372	300	227	162	110	98	138	198	258	310	349	359	329	264	192

24 Hour Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Fri 22/1/16	134	91	76	113	186	269	348	410	439	423	367	289	213	143	91	92	143	207	269	323	361	363	320	247
Sat 23/1/16	175	119	77	74	128	209	294	372	429	445	414	347	267	191	120	77	99	161	226	286	339	370	357	300
Sun 24/1/16	223	156	103	69	86	155	241	324	394	439	437	391	317	238	164	98	77	120	187	251	307	355	371	340
Mon25/1/16	271	196	136	90	73	113	192	276	351	411	438	417	357	279	205	136	86	93	151	219	277	327	363	361
Tue 26/1/16	313	239	171	120	87	94	152	233	310	373	417	423	384	315	138	171	114	90	122	187	250	301	342	361
Wed27/1/16	339	280	208	151	113	99	129	195	270	336	384	409	395	343	270	200	144	106	110	158	221	277	319	347
Thu 28/1/16	347	311	248	186	142	120	126	169	233	297	349	382	389	359	300	231	172	130	116	140	192	249	294	326

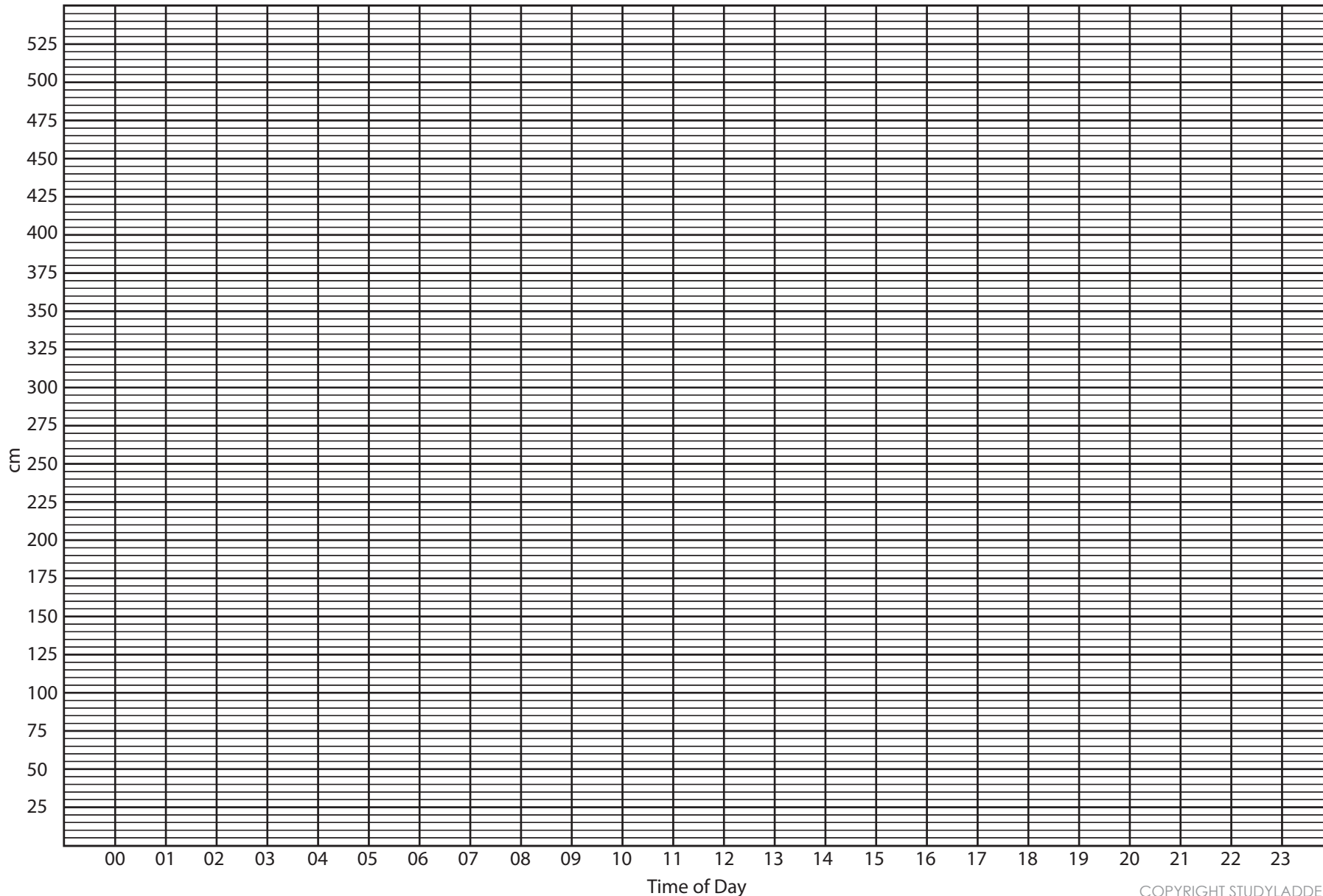| 24 Hour Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Fri 29/1/16	341	326	283	226	177	148	140	159	204	259	310	348	368	359	321	263	203	157	133	136	169	218	265	300
Sat 30/1/16	323	327	305	264	218	183	165	166	189	226	270	308	335	345	329	290	239	191	158	146	158	190	231	269
Sun31/1/16	297	314	314	293	260	225	200	187	189	204	233	266	295	317	322	306	271	230	192	167	159	171	198	233

Extension Activity:

- Print the tide time chart.

- Colour the highest and lowest tide measurements for each day.

Why do you think high tide and low tide occur at different times each day?

◐ Third Quarter
● NewMoon
◑ First Quarter
○ Full Moon

Studyladder

Tide Levels for Gladstone, Queensland. Date: _____ Phase of Moon: _____

cm

525
500
475
450
425
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
25

00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23

Time of Day

- Print a tide levels graph worksheet for each team member.

- Allocate a moon phase to each person in the group.

- Plot the tide levels for each hour of your allocated day.

- Compare the charts and discuss findings.

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