

Training Course on Child Growth Assessment

WHO Child Growth Standards

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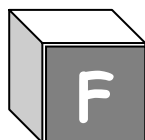
Answer Sheets



World Health
Organization

Training Course on Child Growth Assessment

WHO Child Growth Standards



Answer Sheets



**World Health
Organization**

**Department of Nutrition for
Health and Development**

Answers for Module B:
Measuring a Child's Growth

Answers to Exercise A

1. Salaam's age today: 1 yr 9 mo

The growth charts to be used for Salaam are:

Length-for-age, Boys, 6 months to 2 years, on page 33

Weight-for-age, Boys, 6 months to 2 years, on page 34

Weight-for-length, Boys, Birth to 2 years, on page 35

BMI-for-age, Boys, 6 months to 2 years, on page 36

2. Ruby's date of birth: 1/5/2005

Ruby's age today: 11 mo

The growth charts to be used for Ruby are:

Length-for-age, Girls, 6 months to 2 years, on page 33

Weight-for-age, Girls, 6 months to 2 years, on page 34

Weight-for-length, Girls, Birth to 2 years, on page 35

BMI-for-age, Girls, 6 months to 2 years, on page 36

3. Ivan's age today: 12 wk

The growth charts to be used for Ivan are:

Length-for-age, Boys, Birth to 6 months, on page 29

Weight-for-age, Boys, Birth to 6 months, on page 30

Weight-for-length, Boys, Birth to 6 months, on page 31

BMI-for-age, Boys, Birth to 6 months, on page 32

Answers to Exercise B

Nalah

1. Nalah's Personal Data page should look something like the following:

Personal Data	
Child's name <u>Nalah Parab</u> Identification/Record number _____ Parents' names <u>Hamid and Shira Parab</u> _____ Address <u>40 Rim Road</u> _____	<input checked="" type="checkbox"/> Girl <small>If a boy, must use a Boy's Growth Record</small>
Birth information: Date of birth <u>7-2-2006</u> Gestational age at birth <u>38 wk</u> Single/multiple birth? <u>Single</u> Measurements at birth: Weight <u>2.9 kg</u> Length <u>49 cm</u> Head circumference _____ Birth rank <u>1st</u> Date of birth of next younger sibling (born to mother) _____	
Feeding: Age at introduction of any foods or fluids <u>3wk (water)</u> <small>More details of feeding history may be recorded in Visit Notes</small> Age at termination of breastfeeding _____	
Adverse events (dates): _____ <small>(such as death of parent, death of sibling age <5 years)</small> _____ _____	

2. Nalah's Visit Notes (first row) should appear as follows:

Date of birth: <div style="border: 1px solid black; padding: 2px; display: inline-block;">7-2-2006</div>		Visit Notes			
Date of visit	Age today <small>(Completed years/months or weeks)</small>	Measurements <small>(Record below; then plot on charts)</small>			Reason for visit, observations, recommendations
		Weight (kg)	Length/Height (cm)	BMI*	
25-3-2006	6 wk				immunization

B: Measuring a Child's Growth
Answers to Exercise B, continued

3. The health care provider should use the following growth charts for Nalah at this visit:

Length-for-age, Girls, Birth to 6 months, page 29
Weight-for-age, Girls, Birth to 6 months, page 30
Weight-for-length, Girls, Birth to 6 months, page 31
BMI-for-age, Girls, Birth to 6 years, page 32

Toman

1. Toman's Personal Data page should look something like the following:

Personal Data	
Child's name <u>Toman Baruni</u>	<input checked="" type="checkbox"/> Boy <small>If a girl, must use a Girl's Growth Record</small>
Identification/Record number _____	
Parents' names <u>Mother: Salwa Baruni</u>	
Address <u>100 Centre Street, Apt 22</u>	
Birth information:	
Date of birth <u>10-7-2005</u>	
Gestational age at birth <u>term</u>	Single/multiple birth? <u>single</u>
Measurements at birth:	
Weight <u>3.5 kg</u>	Length _____ Head circumference _____
Birth rank <u>2nd</u>	
Date of birth of next younger sibling (born to mother) _____	
Feeding:	
Age at introduction of any foods or fluids <u>at birth (formula)</u>	More details of feeding history may be recorded in Visit Notes
Age at termination of breastfeeding <u>3 mo</u>	
Adverse events (dates):	
(such as death of parent, death of sibling age <5 years) _____	

B: Measuring a Child's Growth
Answers to Exercise B, continued

2. Toman's Visit Notes (first row) should appear as follows:

Date of birth: 10-7-2005		Visit Notes			
Date of visit	Age today (Completed years/months or weeks)	Measurements (Record below; then plot on charts)			Reason for visit, observations, recommendations <i>Note: Earlier Growth Record lost. Immunizations up-to-date at Gmo.</i>
		Weight (kg)	Length/Height (cm)	BMI*	
15-8-2006	1yr 1mo				well child visit, measles immunization needed

3. The health care provider should use the following growth charts for Toman at this visit:

Length-for-age, Boys, 6 months to 2 years, page 33
 Weight-for-age, Boys, 6 months to 2 years, page 34
 Weight-for-length, Boys, Birth to 2 years, page 35
 BMI-for-age, Boys, 6 months to 2 years, page 36

B: Measuring a Child's Growth

Answers to Exercise C

Nalah

Nalah's Visit Notes page should appear as follows if you used the BMI table to determine BMI. If you used a calculator, compare your results to the BMIs listed below the Visit Notes.

Date of birth: 7-2-2006		Visit Notes			
Date	Age today (Completed years/months or weeks)	Measurements (Record below; then plot on charts)			Reason for visit, observations, recommendations
		Weight (kg)	Length/Height (cm)	BMI*	
25-3-2006	6 wk	3.5	51.3	13.5	immunization
20-4-2006	10 wk	4.2	54.8	14	immunization
22-5-2006	3 mo	4.3	54.8	14	diarrhoea
26-6-2006	4 mo	4.8	56.2	15	immunization
15-8-2006	6 mo	5.4	58.1	16	well-baby visit

* BMI (body mass index) = weight in kilograms divided by length or height in meters squared (kg/m²)

Other information (e.g. drug or food allergies, chronic conditions):

Note: It is equally acceptable to write 13 weeks (instead of 3 months) for Nalah's third visit.

Calculated BMIs:

- 13.3
- 14.0
- 14.3
- 15.2
- 16.0 (rounded from 15.99...)

B: Measuring a Child's Growth
Answers to Exercise C, continued

Toman

Toman's Visit Notes page should appear as follows if you used the BMI table to determine BMI. If you used a calculator, compare your results to the BMIs listed below the Visit Notes.

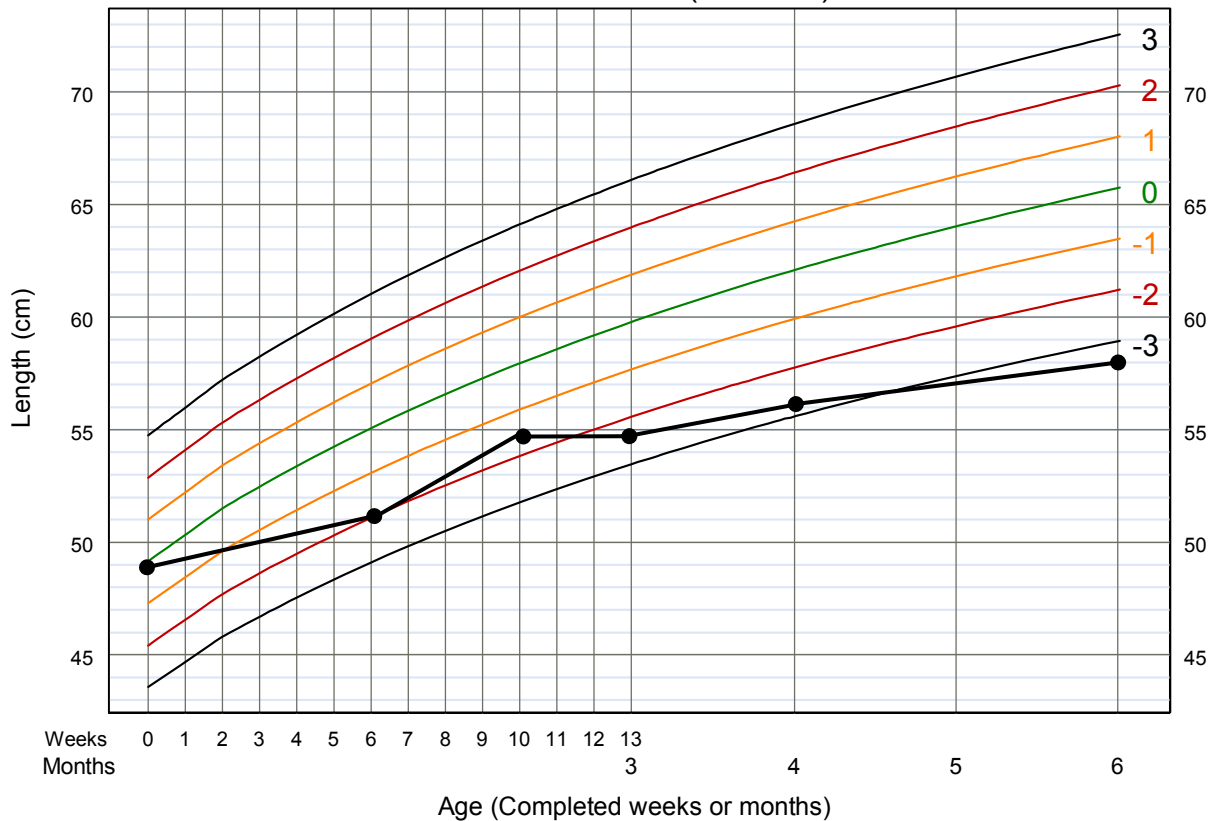
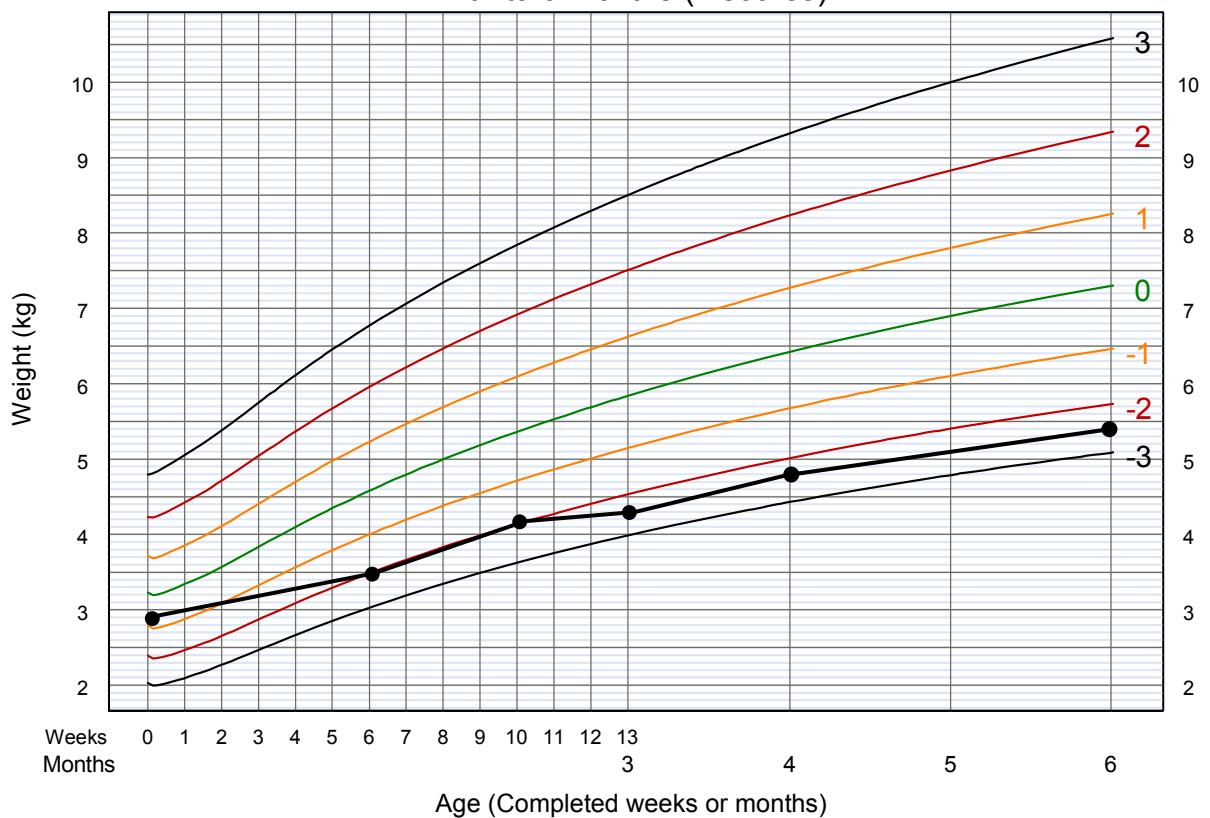
<div style="border: 1px solid black; padding: 2px; display: inline-block;"> Date of birth: 10-7-2005 </div>					
Visit Notes					
Date	Age today (Completed years/months or weeks)	Measurements (Record below; then plot on charts)			Reason for visit, observations, recommendations <i>Note: Earlier Growth Record Lost - Immunizations up-to-date at 6 mo</i>
		Weight (kg)	Length/Height (cm)	BMI*	
15-8-2006	1yr 1mo	11.9	79.0	19	well-child visit, measles immunization needed
15-12-2006	1yr 5mo	13.5	84.5	19	well-child visit
16-3-2007	1yr 8mo	15.0	87.0	20	ear pain
12-7-2007	2yr 0mo	16.8	90.9	20	well-child visit

* BMI (body mass index) = weight in kilograms divided by length or height in meters squared (kg/m²)
Other information (e.g. drug or food allergies, chronic conditions):

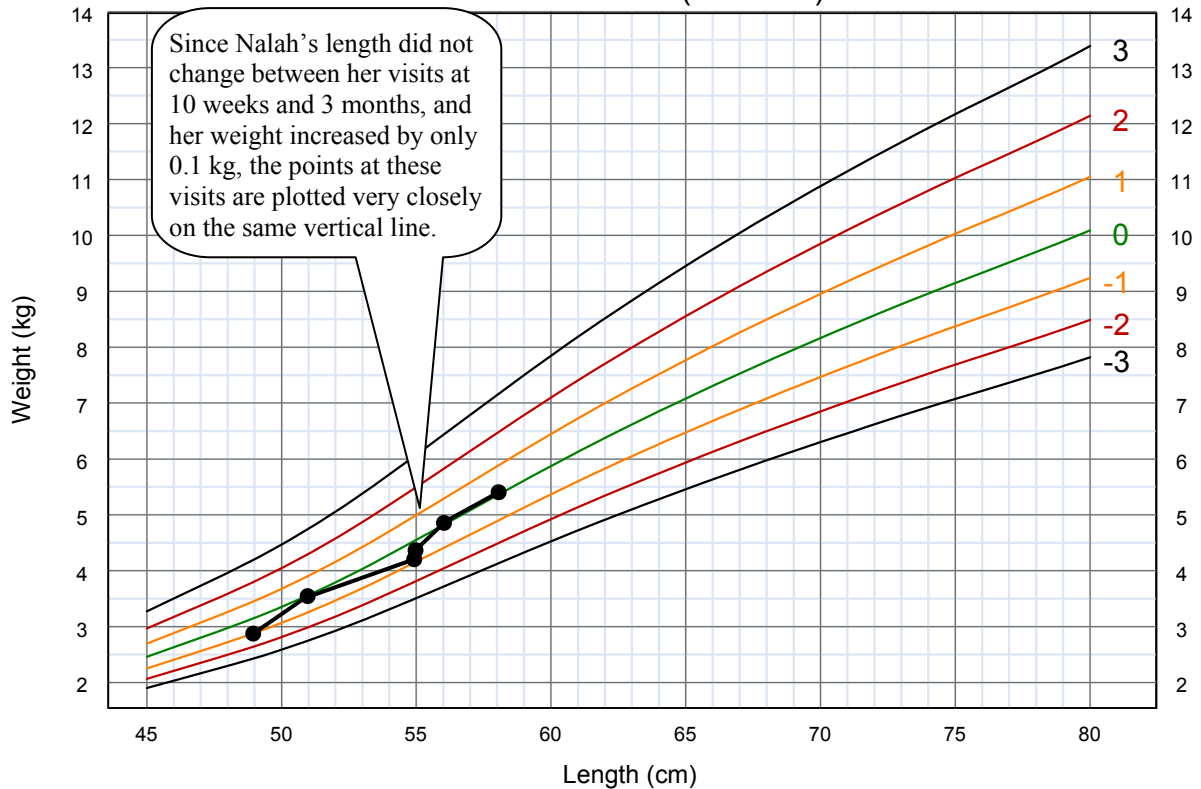
Calculated BMIs: 19.1
 18.9
 19.8
 20.3

Answers for Module C:
Interpreting Growth Indicators

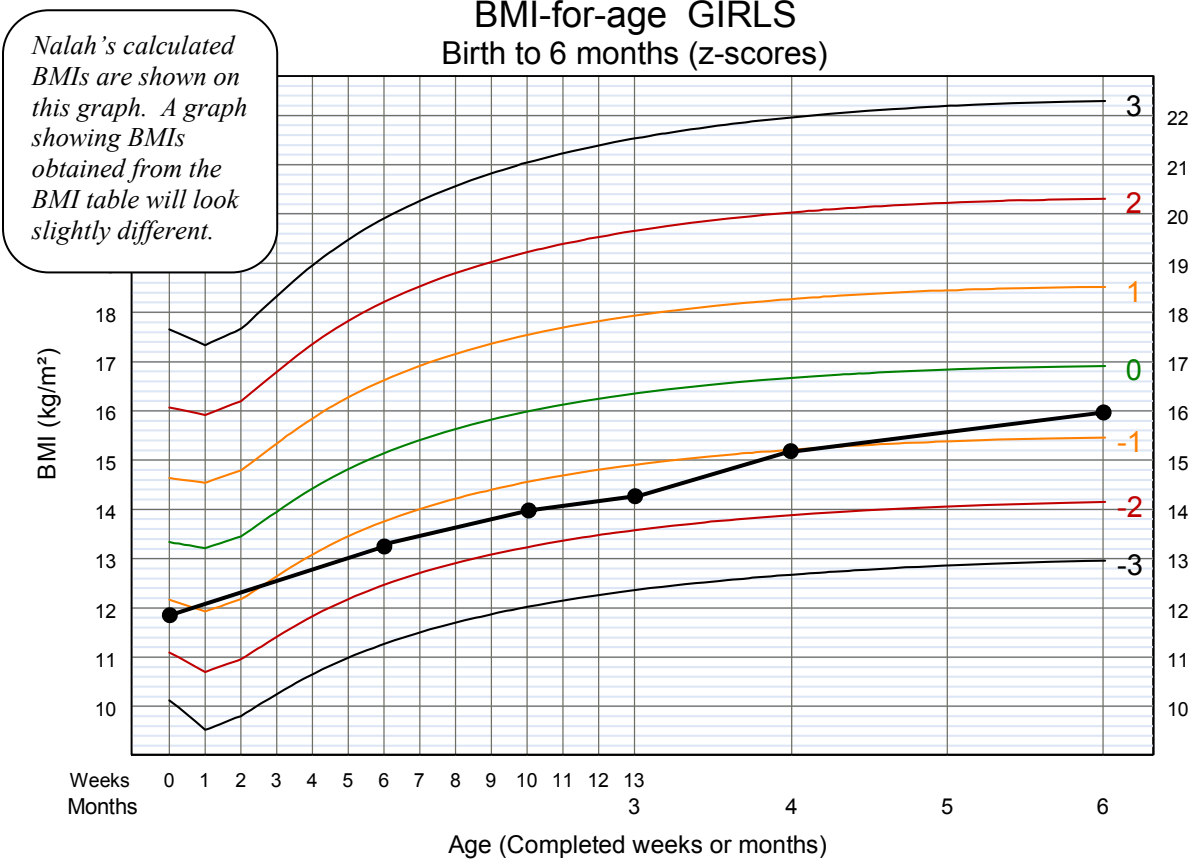
Answers to Exercise A, Nalah

Length-for-age GIRLS
Birth to 6 months (z-scores)Weight-for-age GIRLS
Birth to 6 months (z-scores)

Weight-for-length GIRLS Birth to 6 months (z-scores)

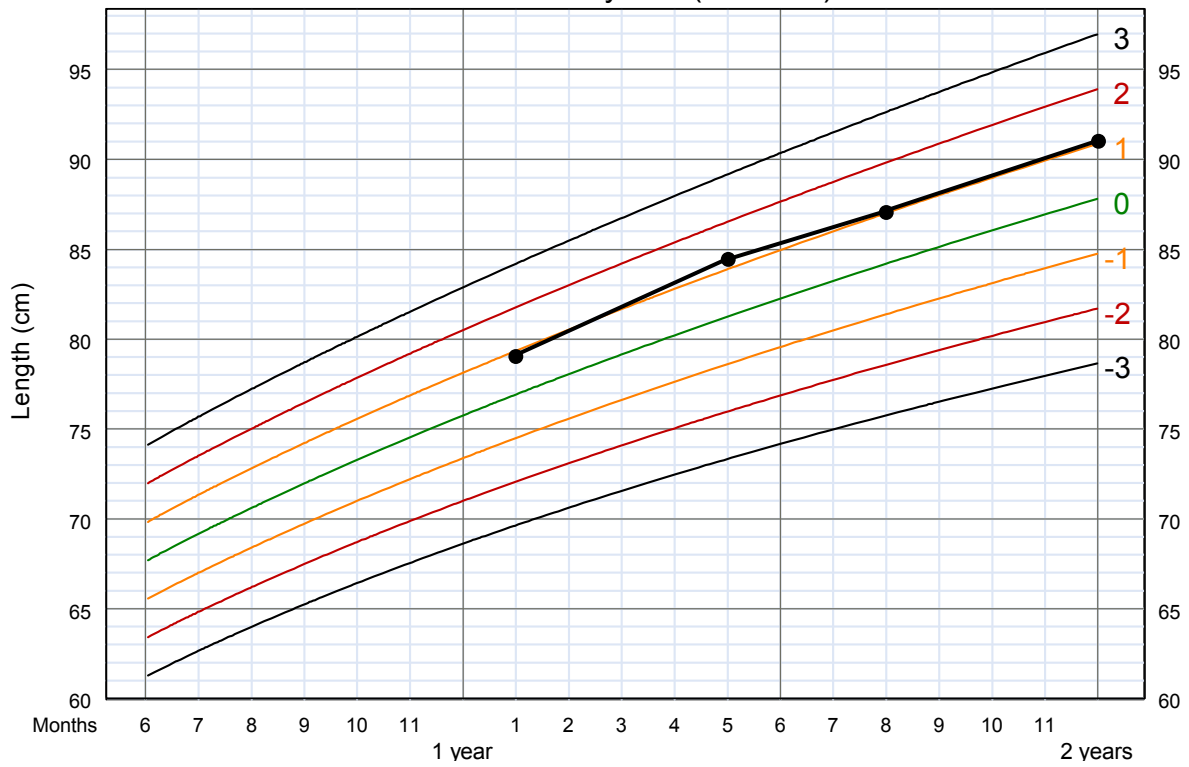


BMI-for-age GIRLS Birth to 6 months (z-scores)

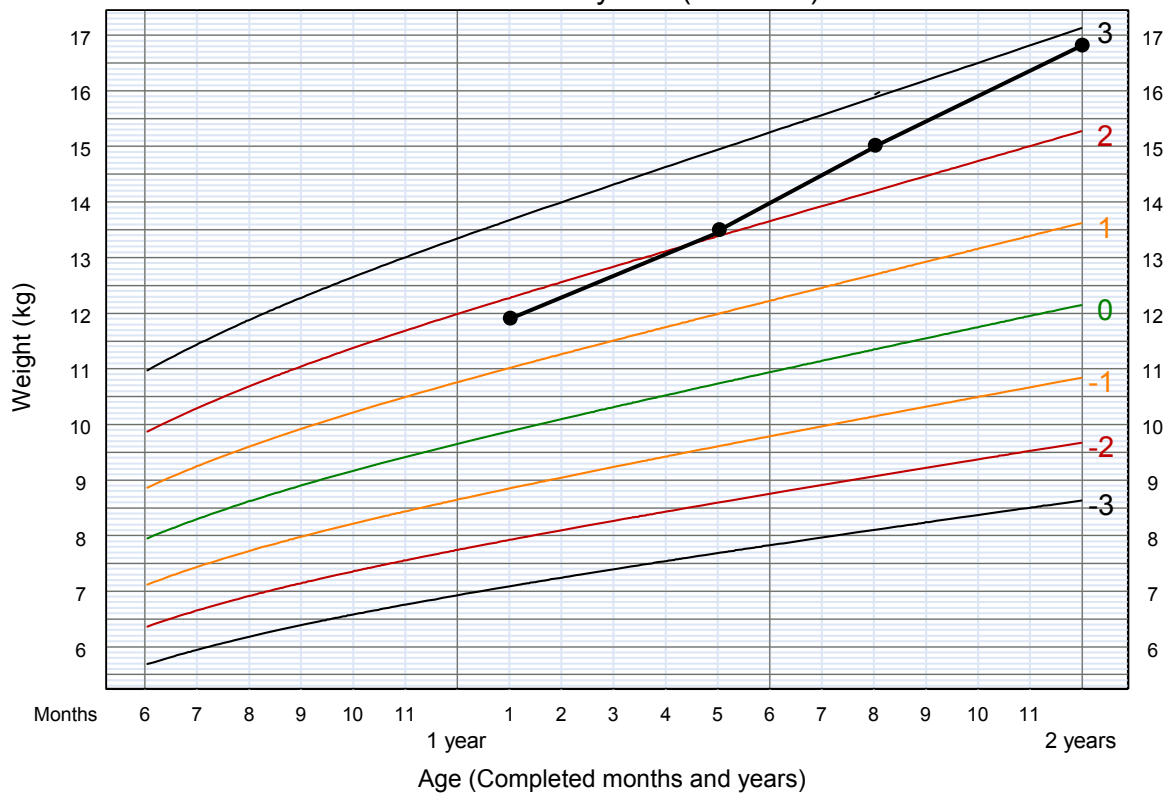


Answers to Exercise A, Toman

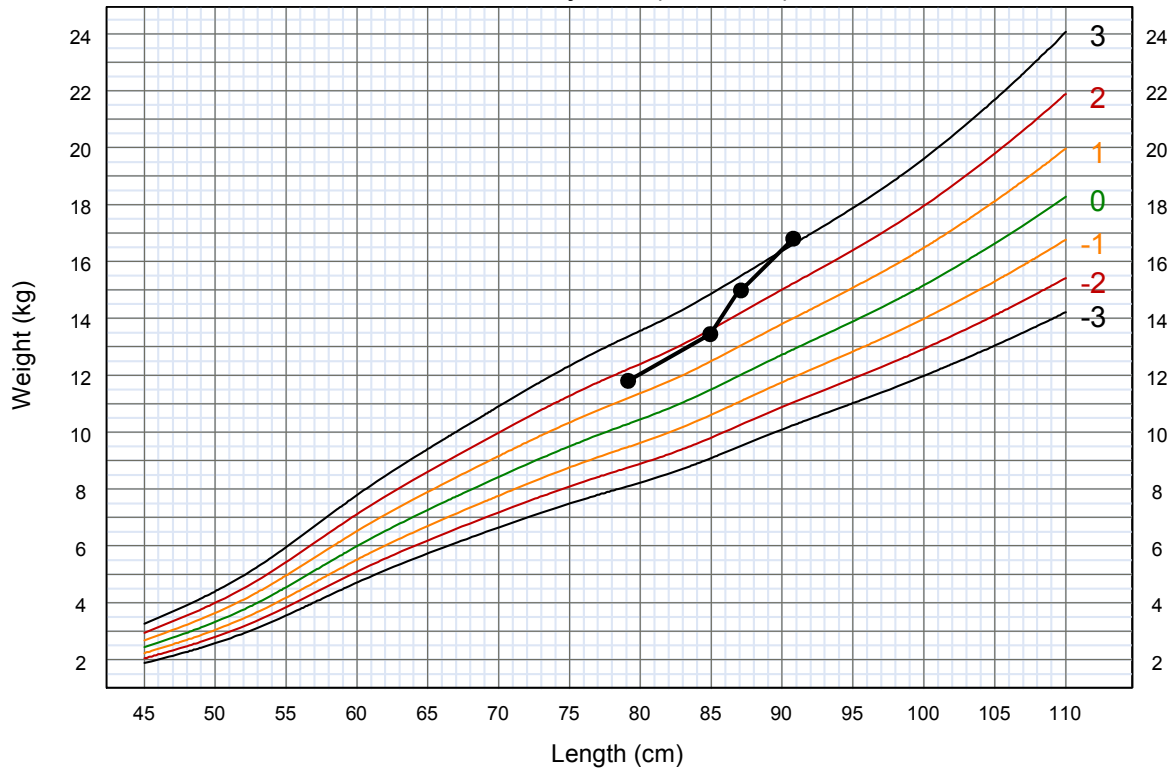
Length-for-age BOYS
6 months to 2 years (z-scores)



Weight-for-age BOYS
6 months to 2 years (z-scores)

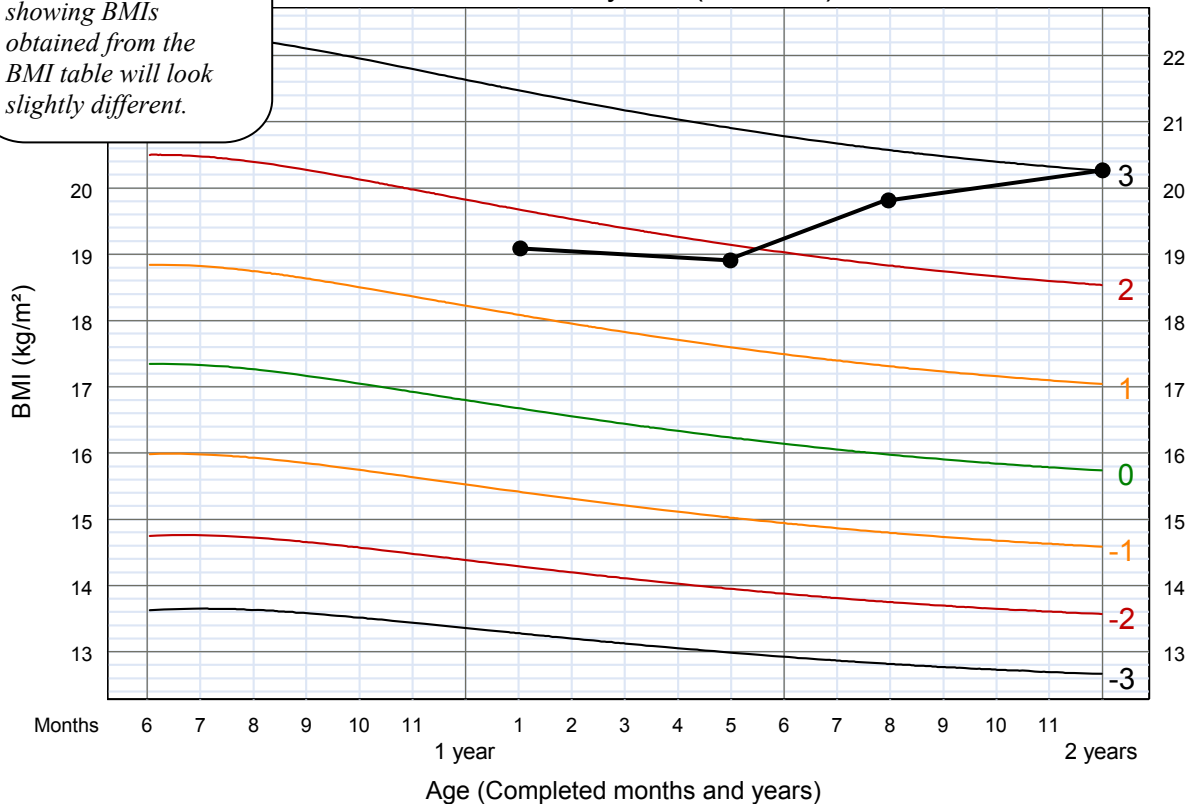


Weight-for-length BOYS
 Birth to 2 years (z-scores)



Toman's calculated BMIs are shown on this graph. A graph showing BMIs obtained from the BMI table will look slightly different.

BMI-for-age BOYS
 6 months to 2 years (z-scores)



Answers to Exercise B

Case 1 – Malek

1. Malek's length-for-age is on or just below the median.
2. Malek's weight-for-age is on the median.
3. Malek's weight-for-length is on the median.
4. Malek's BMI-for-age is just above the median.
5. Malek does not seem to have any growth problem or risk of a growth problem.

Case 2 – Nora

1. Nora's height-for-age is on the median, so it is average for girls her age.
2. Nora's weight-for-age is between the 1 and 2 z-score lines, so she is heavier than average for her age.
3. Nora's weight-for-height is above the 2 z-score line (above 2).
4. Nora's BMI-for-age is also above 2.
5. Nora is overweight.

Case 3 – Delphie

1. Delphie's length-for-age is below -2 .
2. Delphie's weight-for-age is just below the -3 z-score line.
3. Delphie's weight-for-length is on the -2 z-score line.
4. Delphie's BMI-for-age is below -2 .
5. The following growth problems should be ticked: stunted, severely underweight, wasted (based on BMI-for-age).

Answers to Exercise C

Nalah

1. a) Nalah was an average length at birth but has experienced periods of slow growth and stagnation. Her length-for-age has thus dropped from the median at birth to below -3 z-score at 6 months.

b) At 6 months, Nalah is severely stunted.
2. a) Nalah's weight at birth was just below the median but because of periods of very slow growth (e.g. birth to 6 weeks, 10 to 13 weeks), followed by inadequate catch-up growth (e.g. at 6 to 10 weeks and at 3 to 4 months), her weight-for-age has dropped systematically to below -2 z-score at 6 months.

b) Nalah is underweight.
3. a) Nalah's weight-for-length has fluctuated between -1 z-score and the median since birth and at 6 months is tracking along the median.

b) The weight-for-length chart shows the stagnation in length that occurred when Nalah was 55 cm long but currently it does not indicate a growth problem or risk of a problem.
4. a) Nalah's BMI-for-age has stayed close to the -1 z-score line and by 6 months is approaching the median.

b) This chart does not indicate a current growth problem or risk of a problem.
5. Although Nalah was average length at birth, she became severely stunted by the age of 6 months. Her growth in both length and weight stagnated between age 10 weeks and 13 weeks, perhaps because of the episode of diarrhoea for which she was seen at the end of this period. Her weight has stayed appropriate for her length, so problems are not apparent on the weight-for-length and BMI-for-age chart. However, she is severely stunted and underweight according to the length-for-age and weight-for-age charts.

C: Interpreting Growth Indicators
Answers to Exercise C, continued

Toman

1. a) His length-for-age has been consistent, staying very close to the 1 z-score line.
b) No problem or risk of a problem is evident on the length-for-age chart.
2. a) Toman's weight is increasing too rapidly in relation to his age. His weight-for-age line has crossed the 2 z-score line and continued rising.
b) The weight-for-age chart shows that Toman is very heavy for his age, but a judgment of whether he has a problem with overweight should be based on his weight-for-height or BMI-for-age.
3. a) Toman's weight is increasing too rapidly in relation to his length. His weight-for-length has crossed the 2 z-score line and reached the 3 line.
b) The weight-for-length chart shows that Toman is overweight and is at risk of becoming obese.
4. a) (Note: The shape of the BMI-for-age curve will differ slightly when using calculated values versus values from the table). Toman's BMI has increased from above 1 z-score to reach the 3 z-score line (or just below if BMI values from the table are used).
b) Toman is not only overweight but on the threshold of obesity (on or just below 3 z-score).
5. Toman has grown normally in length, tracking along line 1 z-score. But his weight has increased too rapidly for his length and his age, as shown on three of the growth charts (weight-for-age, weight-for-length, and BMI-for-age), where his growth lines are near or on the 3 z-score line. His is overweight and has a definite trend towards obesity.

Answers for Module D:
Counselling on Growth and Feeding

Possible Answers to Exercise C

1. Since Nalah is 6 months old, the health care provider should use list of recommended foods on page 15 of the *Growth Record* and the feeding recommendations on pages 16–17.

2. **Causes of Nalah's undernutrition**

*Nalah has not been fed frequently enough.
Because Nalah's mother works, she has not
been able to breastfeed enough.*

*Nalah is sickly (runny nose, tired),
which may be partly due to hygiene
problems in the home.*

Possible advice to be given

Nalah needs more frequent feedings.

Breastfeed as often as possible.

Give other milk when you cannot breastfeed. (Advice on expressing breast milk may be given if mother is willing and it is possible to store the milk safely.)

Give Nalah a soft staple food such as thick porridge mixed with a bit of oil. Give the porridge 2–3 times a day, 2–3 tablespoons each time.

Increase the amount gradually up to 1/2 cup of mashed food 3 times a day.

Give 1–2 snacks between meals depending on her appetite.

Introduce new foods one at a time. Give Nalah staple foods and a variety of animal-source and other nutritious foods listed on page 15 of the *Growth Record*.

Continue boiling drinking water. Wash utensils used for feeding Nalah in boiled water. Be sure to heat cooked food thoroughly. Wash hands after going to the group latrine, before preparing food, and before feeding Nalah.

See as an example, on the next page, the entry that the health worker wrote in Nalah's *Growth Record*.

D: Counselling on Growth and Feeding

Example of Visit Notes for Nalah

Visit Notes

Feeding: Notes on history, any problems, counselling given
<i>Nalah is underweight and short for her age. Advised to increase breastfeeding; give thick porridge (2–3 tablespoons 2–3 times a day); introduce new foods one at a time such as those on page 15. Return 15 September 2006.</i>

Possible Answers to Exercise E

1. The recommendations on page 19 of the *Growth Record* are applicable for Toman.

2. **Causes of Toman's overweight**

Possible advice to be given

*Too many high energy food choices
such as:*

*Milk with added sugar or chocolate
Soft drinks
Sweets like cookies and cake
Sweet chocolate and nut spreads*

Stop adding sugar and chocolate to milk.

Limit soft drinks (no more than twice per week)

Limit sweets (no more than twice per week)

Use high-calorie spreads sparingly

Bottle of milk used to get Toman to sleep

Give only 500 ml of milk per day. Try rocking or singing Toman to sleep. If he is thirsty, give him water or milk in a cup, not a bottle.

*Lack of control over feeding at
father's and grandmother's home*

Talk to the father and grandmother about Toman's overweight. Show them his *Growth Record*. Tell them the advice given by the health care provider.

*Lack of physical activity and
too much television*

Make sure that Toman has some physical activity each day. Ask the babysitter and Toman's father to take him outside to play.

Sit together at a table for meals instead of watching television.

See as an example, on the next page, the entry that the health worker wrote in Toman's *Growth Record*.

D: Counselling on Growth and Feeding

Example of Visit Notes for Toman

Visit Notes

Feeding: Notes on history, any problems, counselling given
<i>Toman is overweight. Advised to stop adding sugar and chocolate to milk; give only 500 ml milk each day (in cup); increase physical activity (play outdoors). Return 12 October 2007.</i>



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