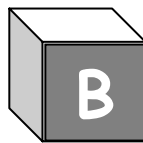


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WHO Child Growth Standards

Training Course on Child Growth Assessment



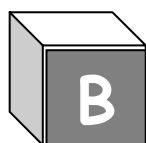
Measuring a Child's Growth



World Health
Organization

WHO Child Growth Standards

Training Course on Child Growth Assessment



Measuring a Child's Growth

Version 1 — November 2006



**World Health
Organization**

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B: Measuring a Child's Growth

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B: Measuring a Child's Growth

Introduction

This module describes how to determine a child's age; recognize clinical signs of certain serious problems of undernutrition; measure a child's weight and length or height; and determine a child's BMI (body mass index).

The child's age, sex, and measurements of weight and length or height will be used to calculate the following growth indicators, which will be described in the next module:

- length/height-for-age
- weight-for-age
- weight-for-length/height
- BMI (body mass index)-for-age

The measurements described in this module should be taken and recorded whenever an infant or child visits a health care provider, for example, for an immunization, a check-up, or care during an illness. There is no WHO-recommended schedule of visits specifically for growth assessment, but some countries may recommend a schedule, such as 6 visits in the first 2 years of life.

Module objectives

Participants will learn how to:

Refer to section:

- | | |
|--|----------|
| • Start a <i>Growth Record</i> for a child and select pages to use at a given visit. | 1.1, 1.3 |
| • Determine a child's age today. | 1.2 |
| • Recognize clinical signs of marasmus and kwashiorkor. | 2.0 |
| • Weigh a child and record weight. | 3.0 |
| • Measure and record length or height. | 4.0 |
| • Determine BMI (body mass index) by referring to a table or using a calculator. | 5.0 |

1.0 Use the Growth Record

A *Growth Record* is a booklet that contains all of the charts needed to record and assess the growth of a child from birth up to 5 years of age. A different *Growth Record* is needed for boys and girls because boys and girls have different weights and lengths beginning at birth. Boys and girls need to be assessed by standards that reflect normal differences in their sizes.



A *Growth Record* should be started for each child and kept by the mother. When a child visits the health facility, ask the mother if the child has a *Growth Record*. If not, start a *Growth Record* as described in section 1.1. If the child already has a *Growth Record*, obtain it from the mother and record today's visit as described in sections 1.2 and 1.3.

If a child's *Growth Record* has been left at home, record information on whatever back-up register or record is available at the health facility, and update the child's *Growth Record* at the next visit. If a child's *Growth Record* is lost or destroyed, replace it if supplies permit.

Praise the mother for having her child's growth assessed regularly.

1.1 Start a new Growth Record

Depending on the sex of the child, select a *Boy's Growth Record* or *Girl's Growth Record*. Show the *Growth Record* to the mother and explain the following points:

- This booklet will be your record of your child's growth and health.
- Each time you visit, your child will be weighed and measured, and the measurements will be recorded in this booklet.
- The booklet includes charts on which we will plot your child's measurements in order to assess his or her growth.
- It has a schedule of immunizations to show when your child needs and receives immunizations.
- It has recommendations about feeding your child and important points about caring for your child at different ages.
- Keep this booklet in a safe place and bring it with you whenever you bring your child to a health facility.

Complete page 1 of the *Growth Record* (Personal Data, opposite) by asking questions of the mother and reviewing any relevant documents that the mother may have, such as a health card or birth certificate.

Personal Data

Child's name _____

Identification/Record number _____

Boy

*If a girl,
must use a
Girl's Growth
Record*

Parents' names _____

Address _____

Birth information:

Date of birth _____

Gestational age at birth _____ Single/multiple birth? _____

Measurements at birth:

Weight _____ Length _____ Head circumference _____

Birth rank _____

Date of birth of next younger sibling (born to mother) _____

Feeding:

Age at introduction of any foods or fluids _____ *More details of feeding history*

Age at termination of breastfeeding _____ *may be recorded in Visit Notes*

Adverse events (dates):

(such as death of parent, death of sibling age <5 years) _____

The date of birth (day/month/year) is especially important. If the date is not documented, ask the mother. If she does not know the date, ask her questions to determine the date as closely as possible; for example, ask when the birth occurred in relation to a local event or holiday.

The gestational age at birth (i.e. the number of weeks of pregnancy) may be recorded in the child's birth record. If not, ask the mother and record whether the baby was **term** (37–41 completed weeks of pregnancy), **pre-term** (before 37 weeks), or **post-term** (42 weeks or more).

Ask and record whether this child was a single or multiple birth. Record other data related to the child's birth if documented, for example, weight, length, and head circumference at birth.

Ask the mother about the child's birth rank (i.e. order). For example, ask: Is this your first child, second child, etc.? Include all live births in order, even if an older sibling has died. For example, if the child is the second-born, but the older sibling has died, you would still record the birth rank as 2nd.

If the mother has had other children after this child, ask when her next younger child was born.

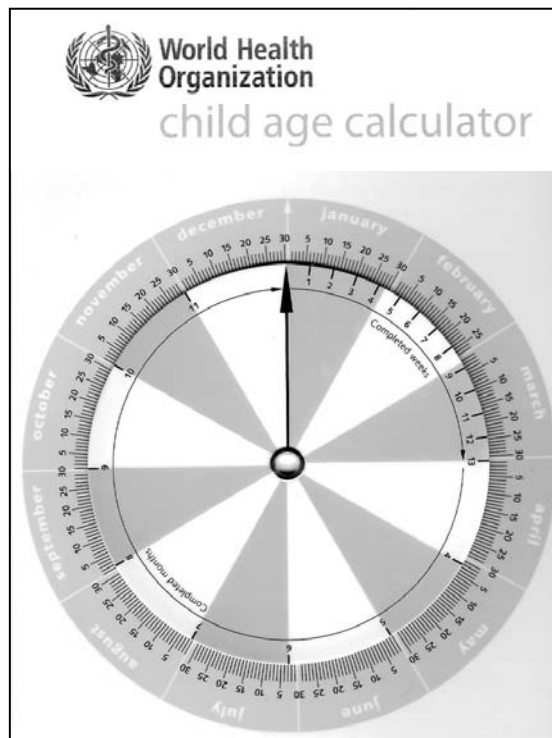
Depending on the child's age, ask appropriate questions to determine whether the child is still breastfeeding – either exclusively or with other foods and fluids. If other foods or fluids have been introduced, ask and record the age at which they were introduced. If the child is no longer breastfeeding, ask and record the age at termination of breastfeeding.

Ask about any adverse events that may affect the child’s health. For example, ask “Are there any events that have happened, such as a death of a family member or caregiver, the separation of parents, or other changes, that could affect the child’s physical or emotional health?” Also ask when these events occurred.

1.2 Record reason for visit and child’s age today

In the Visit Notes section on pages 6–11 of the *Growth Record*, record today’s date (day, month, and year). Ask the mother about the reason for the child’s visit and record the reason in the Visit Notes (for example, immunization, check-up, or illness). If the child is ill, take care of the immediate concerns before continuing the growth assessment process.

It is important to know the precise age of the child in order to assess certain growth indicators. Determine the age of the child today by using a computerized system (if available) or a “child age calculator,” a disk that is turned to calculate a child’s age in completed weeks or months in the first year of life. If the child is more than a year old, you will need to mentally calculate the child’s completed years and then use the disk to determine the number of additional months completed beyond the completed years.



You have been provided a WHO child age calculator with these course materials. Instructions are given on the back of the calculator as well as on the next page.

**When everyone is ready, a facilitator will demonstrate
use of the age calculator for the group.**

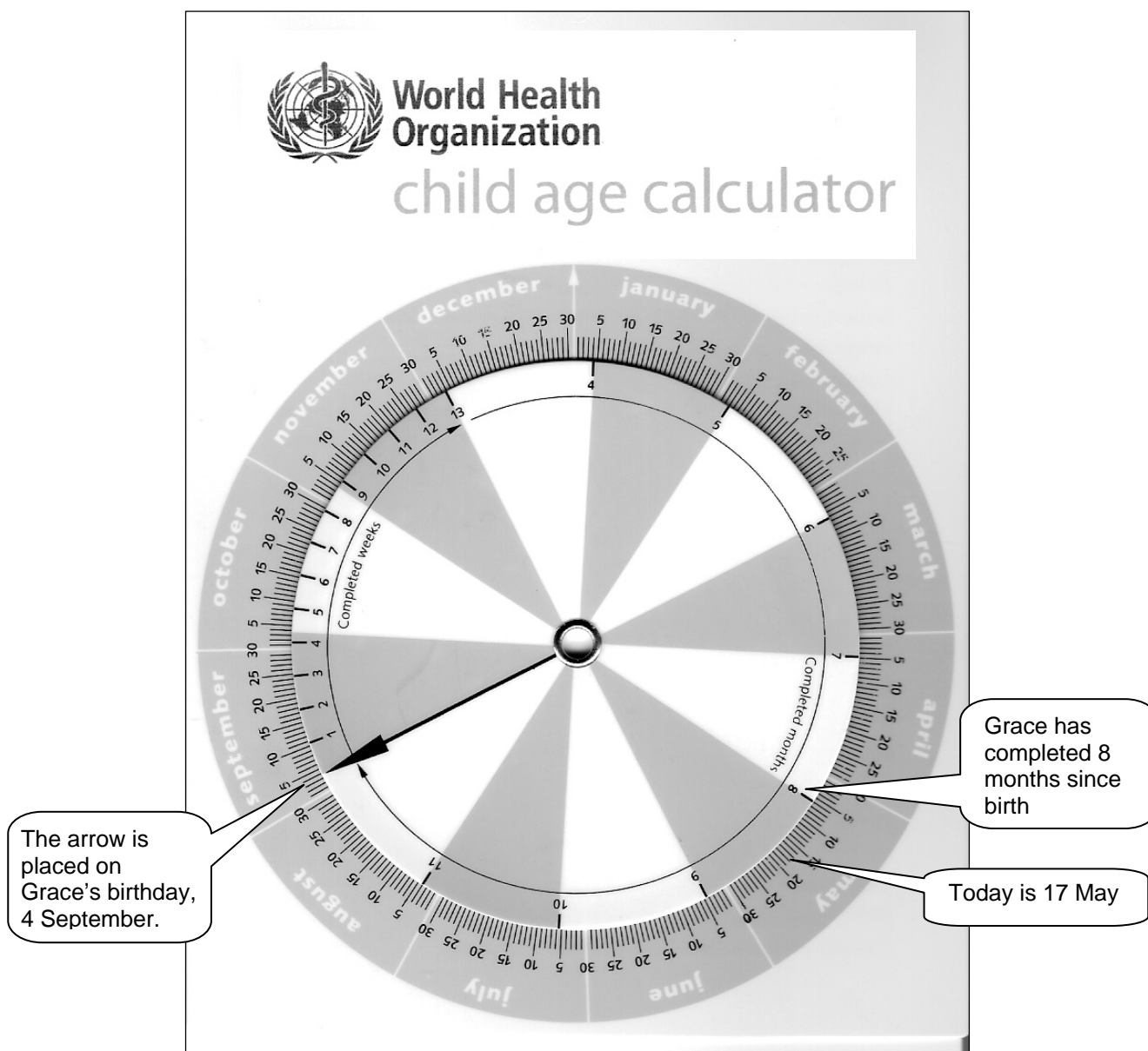
Instructions for use of child age calculator:

1. Determine the child's date of birth. This date should already be recorded in the *Growth Record* on page 1 (Personal Data).
2. Determine and note down the number of full years the child has completed, e.g. ask the mother how many birthdays have been celebrated if this is a local custom. (Note: Simply subtracting the year of birth from the current year will be accurate only if the child has already had a birthday this year.)
 - If the child is one or more years old, you will turn the disk to calculate the number of additional months completed.
 - If the child is less than one year old, you will use the disk to count the number of weeks (in the first 3 months) or months (from 3–11 months) completed since birth.
3. Turn the disk until the bold arrow points to the child's birthday (month and day) on the stationary circular calendar.
4. Locate today's date on the stationary calendar and count on the rotating disk how many months (or weeks if less than 3 months old) the child has completed since birth or the last birthday.
5. Record the child's age today in the Visit Notes of the *Growth Record*. Use abbreviations agreed upon for year, month, and week.
 - If the child is more than 1 year old, record completed years and months, for example, "1 yr 6 mo," "2 yr 3 mo." If no months have been completed beyond the child's birthday, record as "1 yr 0 mo," "2 yr 0 mo," etc.
 - If the child is between 3 months and 1 year old, record completed months, for example, "4 mo," "11 mo."
 - If the child is less than 3 months old, record completed weeks, for example, "9 wk."¹

¹ Weeks must be recorded if the Birth–6 month growth charts presented in the *Growth Record* are used. If a country uses different growth charts that count months rather than weeks from birth, it will not be necessary to record weeks.

Example

Grace Madu is seen at a clinic on 17 May 2006. Her mother has brought her for immunization. Grace's date of birth is already recorded on the Personal Data page of her *Girl's Growth Record* as 4 September 2005. She has not yet completed one year since birth.



To determine Grace's age in completed months, the health care provider turns the disk on the age calculator until the arrow points to her birthday, 4 September. He then locates the current date on the circular calendar. He notes that 8 months have been completed since Grace's birthday.

In the Visit Notes section of the *Growth Record*, on page 6, the health care provider writes Grace's age as "8 mo" and the reason for visit as "immunization."

1.3 Select pages of the Growth Record to use at this visit

You will use the Visit Notes (pages 6–11 of the *Growth Record*) at every visit to record the date, child's age, measurements, reason for visit, observations, recommendations, as well as notes on feeding history, any problems, and counselling given. In addition, you may use other pages of the *Growth Record* appropriate for the child's age, including:

- Growth charts (pages 27–40) – Select the four charts to use based on the child's age at a given visit. Refer to the table of contents at the beginning of the *Growth Record* to make the selection. Growth indicators will be plotted on the selected charts.
- Feeding recommendations (pages 13–20) – Use the recommendations for the child's current or next age group.
- Care messages (pages 21– 26) – As needed, use the messages that are appropriate at all times (page 21) as well as messages about emotional development, communication and movement for the child's current or next age group.
- Recommended national immunization schedule (page 4) – Refer to this page to determine whether a child is due for an immunization. This page may vary by country. Record dates that any immunizations are given and the date of the next scheduled immunization.
- Other national programme recommendations (page 5) – This page will vary according to national recommendations. Record any recommended supplements given, procedures done, etc.

Example

For Grace Madu, the 8-month-old girl described earlier, the health care provider will use the following four growth charts in the *Girl's Growth Record* :

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

The health care provider will also provide any immunizations needed, according to the schedule on page 4.

Depending on the results of Grace's growth assessment and the time available, the health care provider may discuss with the mother feeding recommendations suitable for a child who is 8 months of age. You will learn more about counselling on growth and feeding in module D.



Exercise A

Written Exercise – Determining a child’s age, selecting growth charts to use in the Growth Record

In this exercise you will determine the age of several children using the WHO child age calculator. Then you will determine which growth charts in the *Growth Record* should be used during the child’s growth assessment.

Answer the questions about each case described below:

1. On 30 June 2006, Mrs. Ismail brings her son Salaam to the health centre because he has ear pain. The Personal Data page in Salaam’s *Boy’s Growth Record* says that he was born on 12 September 2004.

What is Salaam’s age today, as it should be recorded in the Visit Notes (page 6) of the *Boy’s Growth Record*?

After weighing and measuring Salaam and recording his weight and length in the Visit Notes, which four growth charts from the *Growth Record* should the health care provider use for Salaam’s growth assessment?

Title of growth chart:

Page number:

2. On 19 April 2006, a girl named Ruby is seen at the health centre for a well-child visit. Ruby’s grandmother says that Ruby’s *Girl’s Growth Record* has been lost. She says that Ruby will celebrate her first birthday soon, on the first day of May. The health care provider begins a new *Girl’s Growth Record* for Ruby by completing the Personal Data page.

What is Ruby’s date of birth, as it should be recorded on the Personal Data page?

What is Ruby’s age today, as it should be recorded on the Visit Notes page?

After weighing and measuring Ruby and recording her weight and length in the Visit Notes, which four growth charts should the health care provider use?

Title of growth chart:

Page number:

3. On 20 August 2006, a baby boy named Ivan is brought to the health centre for immunization. The boy's birth record says that he was born on 26 May 2006. The health care provider begins a *Boy's Growth Record* for Ivan by completing the Personal Data page. He then turns to the Visit Notes page to record Ivan's age today.

What is Ivan's age today, as it should be recorded on the Visit Notes page?

After weighing and measuring Ivan and recording his weight and length in the Visit Notes, which four growth charts should the health care provider use?

Title of growth chart:

Page number:

**When you have finished this exercise,
review your answers with a facilitator.**



Exercise B

Continuing Case Studies – Nalah and Toman

In this exercise, you will begin a *Growth Record* for a girl named Nalah and one for a boy named Toman. You will continue to follow the growth of Nalah and Toman throughout this course. You have been given a *Girl's Growth Record* and a *Boy's Growth Record* to use in this and other exercises about Nalah and Toman.

Read the information about each child below and follow the instructions given.

Nalah

Nalah Parab was born on 7 February 2006. She was a single, term birth (38 weeks of pregnancy). According to her birth record, her weight was 2.9 kg and length was 49 cm. Her head circumference was not measured.

Nalah's parents are Hamid and Shira Parab. Their address is at 40 Rim Road. Nalah is the first and only child born to her mother. She is breastfed, but she has also been taking some water since she was 3 weeks old. There have been no unusual adverse events in her life so far.

The date of Nalah's visit to the health centre is 25 March 2006. Her mother has brought her for immunizations.

Instructions:

1. Complete the Personal Data page of the *Girl's Growth Record* for Nalah. (You may make up a record number.)
2. In the Visit Notes section of the *Girl's Growth Record*, record Nalah's date of birth. On the first row, enter the date of Nalah's visit, her age today, and the reason for her visit.
3. List below the titles and page numbers of the four growth charts that the health care provider should use during Nalah's growth assessment.

Toman

Toman Baruni comes to the health centre with his mother, Salwa Baruni, on 15 August 2006 for a well-child visit. Mrs Baruni thinks that it must be time for Toman to have another immunization, but she has lost his *Growth Record*, so she is not sure. She says that his last visit to the health centre was at 6 months, and he had received all of his immunizations at that point.

In order to start a new *Boy's Growth Record*, the health care provider asks Mrs Baruni about Toman's birth. Mrs Baruni says that Toman was born on 10 July 2005. He was a single, term birth and weighed 3.5 kg. She does not remember his length or head circumference.

Mrs Baruni was sick at Toman's birth, and Toman was given infant formula by the nurses for 3 days in the hospital. After leaving the hospital Mrs Baruni breastfed Toman, but she stopped after 3 months.

Toman is Mrs Baruni's second child. He lives with her at 100 Centre Street, Apartment 22. Mrs Baruni's first child was born of a different husband and lives with him. Toman has no younger siblings. Mr and Mrs Baruni have separated since Toman's birth, but he spends weekends with his father. Mrs Baruni does not think that the separation has been traumatic for Toman.

Instructions:

1. Complete the Personal Data page of the *Boy's Growth Record* for Toman. (You may make up a record number.)
2. Above the Visit Notes section of the *Boy's Growth Record*, record Toman's date of birth for easy reference. On the first row, enter the date of Toman's visit, his age today, and the reason for his visit.
3. List below the titles and page numbers of the four growth charts that the health care provider should use during Toman's growth assessment.

**When you have finished this exercise,
review your answers with a facilitator.**

2.0 Observe the child and note clinical signs of marasmus and kwashiorkor

When a child is undressed to prepare for weighing, certain clinical signs of severe undernutrition may be apparent. It is important to recognize signs of **marasmus** and **kwashiorkor** since they require urgent specialized care that may include special feeding regimens, careful monitoring, antibiotics, etc. Regardless of their weight, children with these syndromes should be referred for urgent care.

- **Marasmus:** In this form of severe undernutrition, the child is **severely wasted** and has the appearance of “**skin and bones**” due to loss of muscle and fatty tissue. The child’s face looks like an old man’s following loss of facial subcutaneous fat, but the eyes may be alert. The ribs are easily seen. There may be folds of skin on the buttocks and thighs that make it look as if the child is wearing “baggy pants.” Weight-for-age and weight-for-length/height are likely to be very low. Look at photos 1, 2, and 3 in *E: Photo Booklet*, which show children with marasmus.



- **Kwashiorkor:** In this form of severe undernutrition, the child’s muscles are wasted, but the wasting may not be apparent due to **generalized oedema** (swelling from excess fluid in the tissues). The child is withdrawn, irritable, obviously ill and will not eat. The face is round (because of oedema) and the **hair is thin, sparse and sometimes discoloured**. The **skin has symmetrical discoloured patches where the skin later cracks and peels off**. A child with kwashiorkor will usually be underweight, but the oedema may mask the true weight. (See **oedema of both feet** on the next page.) Look at photos 4 and 5 in *E: Photo Booklet*, which show children with signs of kwashiorkor.

- **Marasmic kwashiorkor:** Kwashiorkor and marasmus are distinct conditions, but in communities where both occur, cases of severe undernutrition often have features of both. For example, a child may have severe wasting as seen in marasmus, along with the skin and hair changes or oedema typical in kwashiorkor. Look at photo 6 in *E: Photo Booklet*, which shows a child with marasmic kwashiorkor. The child's upper body is wasted, but the lower limbs are swollen with oedema.
- **Oedema of both feet:** Oedema of both feet is a sign that a child needs referral, even if other signs of kwashiorkor are not present. The oedema must appear in both feet. (If the swelling is in only one foot, it may just be a sore or infected foot.) To check for oedema, grasp the foot so that it rests in your hand with your thumb on top of the foot. Press your thumb gently for a few seconds. The child has oedema if a pit (dent) remains in the foot when you lift your thumb. Look at photos 4, 6, 7, and 8 in *E: Photo Booklet*, which show oedema of both feet.

A child with oedema of both feet is automatically considered severely underweight, regardless of what the scale shows. You should weigh and measure the child, but do not determine a BMI based on the weight. Note the weight, length/height, and the oedema in the Visit Notes. When plotting the child's measurements, indicate on the graphs, near the relevant points, that the child has oedema. Refer the child for specialized care.



If a child has marasmus, kwashiorkor, or oedema of both feet, note these observations in the Visit Notes and refer the child for specialized care.

Recording other observations

Other observations about the child's appearance may also be recorded in the Visit Notes before weight and length/height are measured. The following terms may be useful in recording your observations. Keep in mind, however, that some of these terms have more technical definitions based on the child's charted weight-for-length/height and BMI-for-age.

Terms for recording observations about the child's appearance:

- Wasted* (too thin)
- Lean (fleshed out, no noticeable fat)
- Normal (rounded contours, no noticeable excess fat)
- Heavy (sturdy, mostly muscular, not lean or thin)
- Overweight* (noticeable fat)
- Obese* (excess fat)

* You will learn more technical definitions for these terms in the next module.

3.0 Measure weight

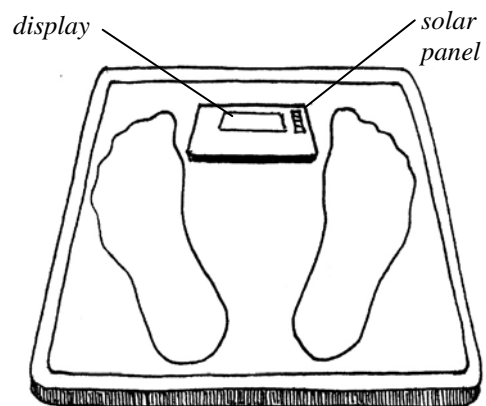
It is recommended to weigh children using a scale with the following features:

- Solidly built and durable
- Electronic (digital reading)
- Measures up to 150 kg
- Measures to a precision of 0.1 kg (100g)
- Allows tared weighing

“Tared weighing” means that the scale can be re-set to zero (“tared”) with the person just weighed still on it. Thus, a mother can stand on the scale, be weighed, and the scale tared. While remaining on the scale, if she is given her child to hold, the child’s weight alone appears on the scale. Tared weighing has two clear advantages:

- There is no need to subtract weights to determine the child’s weight alone (reducing the risk of error).
- The child is likely to remain calm when held in the mother’s arms for weighing.

There are many types of scales currently in use. The UNISCALE (made by UNICEF) has the recommended features listed above and is used in this course to demonstrate weighing techniques. It is powered by a lithium battery that is good for a million measurement sessions. The scale has a solar on-switch, so it requires adequate lighting to function. Footprints may be marked on the scale to show where a person should stand. This module will describe how to weigh a child using the UNISCALE or a similar model. Care and maintenance of the UNISCALE is described in section 5.0 of this module.



UNISCALE

A taring scale is easy to use and reliable. However, there are other types of scales that may be reliable, for example, an electronic baby scale, or a paediatric beam balance that has been calibrated. Children who can stand alone can be weighed standing on a scale. Otherwise, the mother can be weighed alone; then the mother and child can be weighed together and the mother’s weight subtracted to determine the child’s weight.

Bathroom scales and hanging scales are not recommended as they tend to be unreliable.

3.1 Prepare for weighing

Explain to the mother the reasons for weighing the child, for example, to see how the child is growing, how the child is recovering from a previous illness, or how the child is responding to changes that have been made in his feeding or care.

If the child is less than 2 years old or is unable to stand, you will do tared weighing.

Explain the tared weighing procedure to the mother as follows. Stress that the mother must stay on the scale until her child has been weighed in her arms.

- The mother will remove her shoes and step on the scale to be weighed alone first. She may need to adjust any long garments that could cover the display and solar panel of the scale.
- After the mother's weight appears on the display, tell her to remain standing on the scale. Re-set the reading to zero by covering the solar panel of the scale (thus blocking out the light).
- Then give the mother her child to hold.
- The child's weight will appear on the scale.
- Record the child's weight.

If the child is 2 years or older, you will weigh the child alone if the child will stand still.

Explain that the child will need to step on the scale alone and stand very still.

Undress the child. Explain that child needs to remove outer clothing in order to obtain an accurate weight. A wet diaper, or shoes and jeans, can weigh more than 0.5 kg. Babies should be weighed naked; wrap them in a blanket to keep them warm until weighing. Older children should remove all but minimal clothing, such as their underclothes.

If it is too cold to undress a child, or if the child resists being undressed and becomes agitated, you may weigh the clothed child, but note in the *Growth Record* that the child was clothed. It is important to avoid upsetting the child so that the length/height measurements can also be taken.

If it is socially unacceptable to undress the child, remove as much of the clothing as possible.

Note: If the child has braids or hair ornaments that will interfere with length/height measurements, remove them **before weighing** to avoid delay between the measurements. Especially with young children whose length will be measured, it is important to move quickly and surely from the scale to the length board to avoid upsetting the child.

3.2 Weigh a child using tared weighing

Be sure that the scale is placed on a flat, hard, even surface. It should not be placed on a loose carpet or rug, but a firm carpet that is glued down is acceptable. Since the scale is solar powered, there must be enough light to operate the scale.

- To turn on the scale, cover the solar panel for a second. When the number 0.0 appears, the scale is ready.
- Check to see that the mother has removed her shoes. You or someone else should hold the naked baby wrapped in a blanket.
- Ask the mother to stand in the middle of the scale, feet slightly apart (on the footprints, if marked), and remain still. The mother's clothing must not cover the display or solar panel. Remind her to stay on the scale even after her weight appears, until the baby has been weighed in her arms.
- With the mother still on the scale and her weight displayed, tare the scale by covering the solar panel for a second. The scale is tared when it displays a figure of a mother and baby and the number 0.0.
- Gently hand the naked baby to the mother and ask her to remain still.
- The baby's weight will appear on the display. Record this weight in the Visit Notes of the child's *Growth Record*. Be careful to read the numbers in the correct order (as though you were viewing while standing on the scale rather than upside-down).

Note: If a mother is very heavy (e.g. more than 100 kg) and the baby's weight is relatively low (e.g. less than 2.5 kg), the baby's weight may not register on the scale. In such cases, have a lighter person hold the baby on the scale.

Example



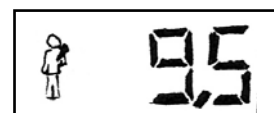
Mother's weight alone



Taring the scale



Baby's weight appears on display:



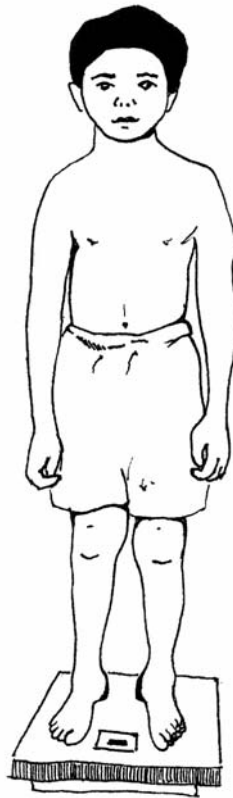
Note that the scale pictured above weighs with a precision to the nearest 0.1 kg. **Precision** describes the smallest exact unit that the scale can measure. The **accuracy** of the measurements, however, depends on whether the scale is calibrated and whether the observer reads the display correctly. Care of the measurement instruments to maximize accuracy will be described in section 5.0 of this module.

3.3 Weigh a child alone

If a child is 2 years old or older and will stand still, weigh the child alone. Ask the mother to help the child remove shoes and outer clothing. Talk with the child about the need to stand still. Communicate with the child in a sensitive, non-frightening way.

- To turn on the scale, cover the solar panel for a second. When the number 0.0 appears, the scale is ready.
- Ask the child to stand in the middle of the scale, feet slightly apart (on the footprints, if marked), and to remain still until the weight appears on the display.
- Record the child's weight to the nearest 0.1 kg.

If the child jumps on the scale or will not stand still, you will need to use the tared weighing procedure instead.



4.0 Measure length or height

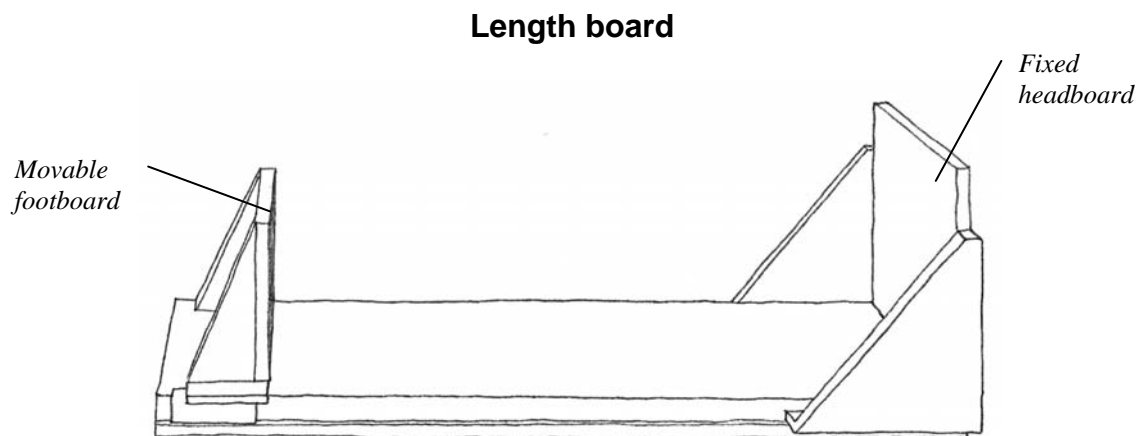
Depending on a child's age and ability to stand, measure the child's length or height. A child's length is measured lying down (recumbent). Height is measured standing upright.

- If a child is less than 2 years old, measure recumbent length.
- If the child is aged 2 years or older and able to stand, measure standing height.

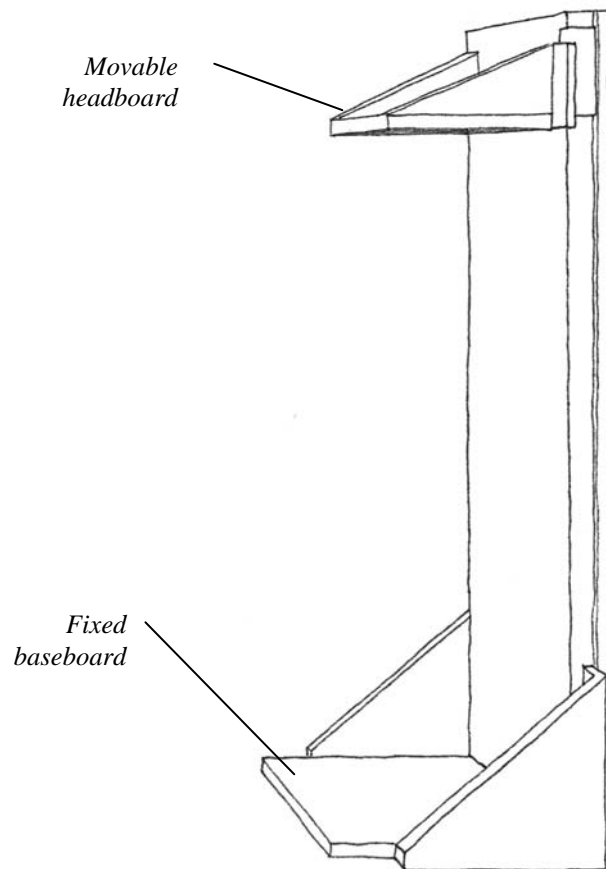
In general, standing height is about 0.7 cm less than recumbent length. This difference was taken into account in developing the WHO growth standards used to make the charts in the *Growth Record*. Therefore, it is important to adjust the measurements if length is taken instead of height, and vice versa.

- If a child less than 2 years old will not lie down for measurement of length, measure standing height and **add 0.7 cm** to convert it to length.
- If a child aged 2 years or older cannot stand, measure recumbent length and **subtract 0.7 cm** to convert it to height.

Equipment needed to measure length is a length board (sometimes called an infantometer) which should be placed on a flat, stable surface such as a table. To measure height, use a height board (sometimes called a stadiometer) mounted at a right angle between a level floor and against a straight, vertical surface such as a wall or pillar.



Height board



A good length or height board should be made of smooth, moisture-resistant (varnished or polished) wood. The horizontal and vertical pieces should be firmly joined at right angles. A movable piece serves as the footboard when measuring length or the headboard when measuring height. Unless there is a digital counter, a measuring tape should be fixed firmly in a groove along the length of the board, so that moving parts do not scrape it and rub off the markings. Care of length and height boards is described in section 5.0.

4.1 Prepare to measure length or height

Be prepared to measure length/height immediately after weighing, while the child's clothes are off. Check that the child's shoes, socks, and hair ornaments have been removed. Undo braids if they will interfere with the measurement of length/height.

If a baby is weighed naked, a dry diaper can be put back on to avoid getting wet while measuring length. If the room is cool and there is any delay, keep the child warm in a blanket until length/height can be measured.

Whether measuring length or height, the mother is needed to help with measurement and to soothe and comfort the child. Explain to the mother the reasons for the measurement and the steps in the procedure. Answer any questions that she may have. Show her and tell her how she can help you. Explain that it is important to keep the child still and calm to obtain a good measurement.

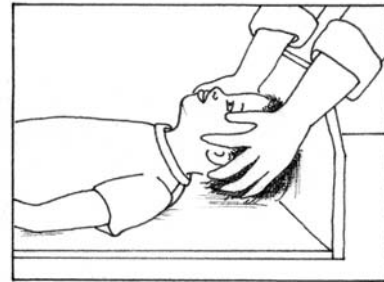
4.2 Measure length

Cover the length board with a thin cloth or soft paper for hygiene and for the baby's comfort.

Explain to the mother that she will need to place the baby on the length board herself and then help to hold the baby's head in place while you take the measurement. Show her where to stand when placing the baby down, i.e. opposite you, on the side of the length board away from the tape. Also show her where to place the baby's head (against the fixed headboard) so that she can move quickly and surely without distressing the baby.

When the mother understands your instructions and is ready to assist:

- Ask her to lay the child on his back with his head against the fixed headboard, compressing the hair.
- Quickly position the head so that an imaginary vertical line from the ear canal to the lower border of the eye socket is perpendicular to the board. (The child's eyes should be looking straight up.) Ask the mother to move behind the headboard and hold the head in this position.



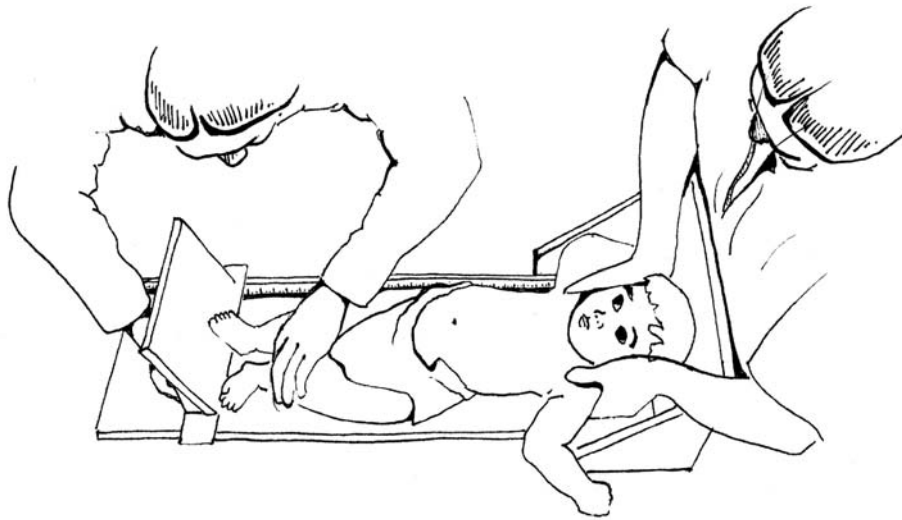
Speed is important. Standing on the side of the length board where you can see the measuring tape and move the footboard:

- Check that the child lies straight along the board and does not change position. Shoulders should touch the board, and the spine should not be arched. Ask the mother to inform you if the child arches the back or moves out of position.
- Hold down the child's legs with one hand and move the footboard with the other. Apply gentle pressure to the knees to straighten the legs as far as they can go without causing injury. *Note: it is not possible to straighten the knees of newborns to the same degree as older children. Their knees are fragile and could be injured easily, so apply minimum pressure.*

If a child is extremely agitated and both legs cannot be held in position, measure with one leg in position.

- While holding the knees, pull the footboard against the child's feet. The soles of the feet should be flat against the footboard, toes pointing upwards. If the child bends the toes and prevents the footboard from touching the soles, scratch the soles slightly and slide in the footboard quickly when the child straightens the toes.
- Read the measurement and record the child's length in centimetres to the last **completed** 0.1 cm in the Visit Notes of the *Growth Record*. This is the last line that you can actually see. (0.1 cm = 1 mm)

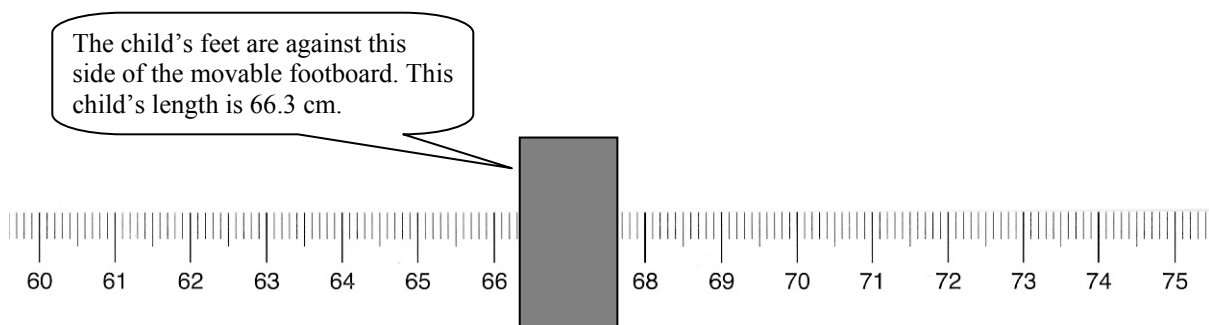
Remember: If the child whose length you measured is 2 years old or more, subtract 0.7 cm from the length and record the result as height in the Visit Notes.



Move quickly and surely to measure length accurately before the baby becomes agitated.

Example

Following is a picture of part of a measuring tape. The numbers and longer lines indicate centimetre markings. The shorter lines indicate millimetres. The gray box shows the position of the footboard when a length measurement is taken.



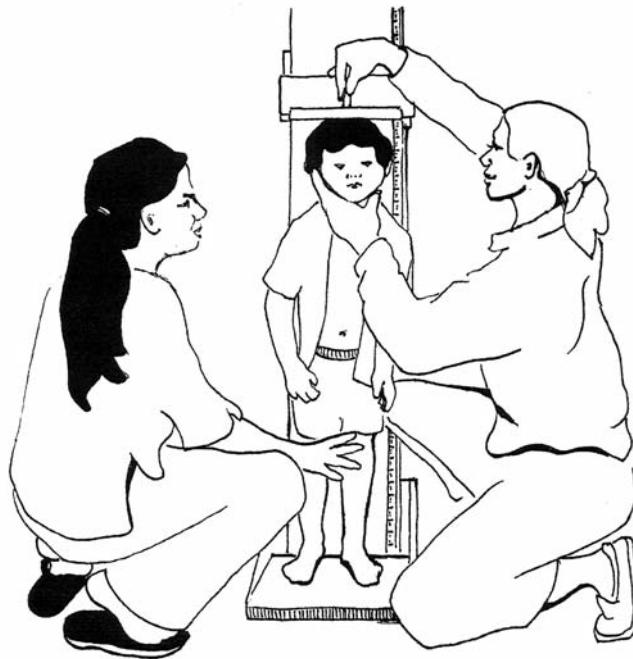
4.3 Measure standing height

Ensure that the height board is on level ground. Check that shoes, socks and hair ornaments have been removed.

Working with the mother, and kneeling in order to get down to the level of the child:

- Help the child to stand on the baseboard with feet slightly apart. The back of the head, shoulder blades, buttocks, calves, and heels should all touch the vertical board.
- Ask the mother to hold the child's knees and ankles to help keep the legs straight and feet flat, with heels and calves touching the vertical board. Ask her to focus the child's attention, soothe the child as needed, and inform you if the child moves out of position.
- Position the child's head so that a horizontal line from the ear canal to the lower border of the eye socket runs parallel to the baseboard. To keep the head in this position, hold the bridge between your thumb and forefinger over the child's chin.
- If necessary, push gently on the tummy to help the child stand to full height.
- Still keeping the head in position, use your other hand to pull down the headboard to rest firmly on top of the head and compress the hair.
- Read the measurement and record the child's height in centimetres to the last **completed** 0.1 cm in the Visit Notes of the *Growth Record*. This is the last line that you can actually see. (0.1 cm = 1 mm)

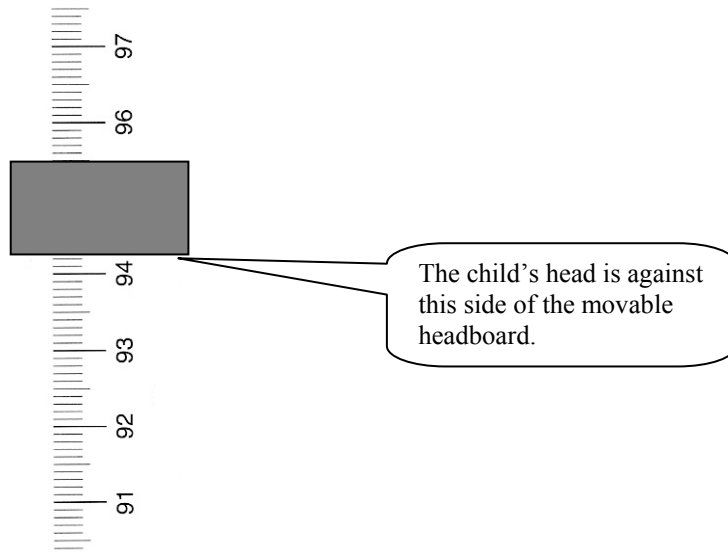
Remember: If the child whose height you measured is less than 2 years old, add 0.7 cm to the height and record the result as length in the Visit Notes.



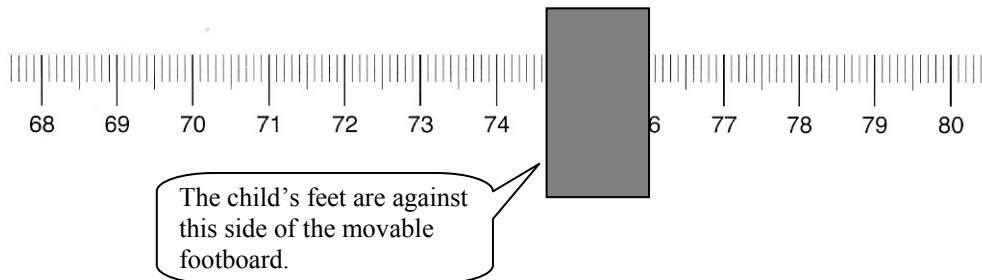
SHORT ANSWER EXERCISE

Read the measuring tapes below and record the measurements to the nearest 0.1 cm.

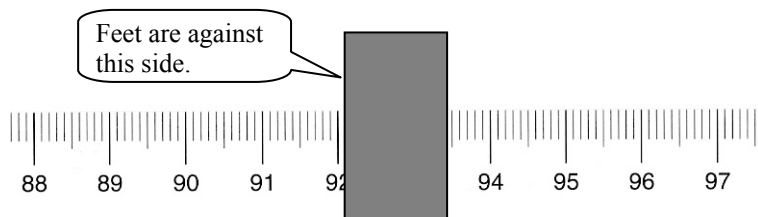
- This picture shows part of a measuring tape for a 3-year-old whose height is being measured. Record the height: _____



- This picture shows part of a measuring tape for an 11-month-old child whose length is being measured. Record the length: _____



- This picture shows part of a measuring tape for 2-year-old child who will not stand on the measuring board. His length is being measured, but his height must be recorded. What is his length? _____ What height should be recorded? _____



When you have finished this exercise, compare your answers to those given on page 34 at the end of this module. If you have questions, talk with a facilitator.