

Significance of health checkups and their methods

Learning objectives

You will be able to gain proper understanding and explain:

- The significance of health checkups and learn to conduct health checkups correctly.
- Based on the results of health checkup, how to identify health issues of children, screen them, and consider appropriate measures at school.
- The importance of creating a system for conducting high-quality and continuous health checkups at schools.

In this chapter, you will learn about the significance of health checkups; specific procedures for measuring and recording height, weight, eyesight, and hearing; how to utilize these data; and how to plan and prepare for health checkups at the school.

1. Significance of health checkups

There are **two objectives for health checkups (health examinations and physical measurements)**:

The first is to check and evaluate whether children are growing steadily, and if abnormalities are discovered, refer to health services. The second is to identify the health issues of children as a group, and link to appropriate responses and health education at the school.

The primary goal of school health is for children to grow and develop soundly. As discussed in Chapter 3, the growth and development of children is promoted or interfered with by various factors (i.e., biological, behavioral, and physical/social environmental factors). Hence, it is important to regularly check, evaluate, and screen whether children are growing and developing soundly. If children are left in a state where their growth/development is inhibited, it can cause a negative spiral that interferes with learning and daily life and further inhibits growth/development. If the growth and development of a child is not smooth, it is vital to investigate the factors and make necessary improvements. Examples of factors that inhibit growth and development may include serious illnesses, nutritional conditions, unfavorable living environments, daily rhythm, and psychological stress.

Health checkups aim not only to evaluate the individual growth and development of children, but to identify and improve collective health issues. For example, suppose a school has discovered that many of its children have poor eyesight through a health checkup. To improve this, the school can propose to adjust the brightness of the classrooms, provide health education to the children regarding their posture and eye health, and take other measures on a schoolwide basis to improve the eyesight of the children. In this way, it is important to connect the health checkup to health education and school health activities.

Health checkup systems and programs vary from country to country. At present, most schools in

Cambodia do not conduct health checkups. However, all schools in the country are called on to conduct health checkups to ensure the sound growth and development of children (see the National School Health Policy 2019 in chapter 1). Some countries include clinical medical tests such as electrocardiography, radiography, and urinalysis in health checkups. This chapter will focus on easy and effective measurements and tests that are feasible in Cambodia: height measurement, weight measurement, eye test, and hearing test.

Column: Health checkup is “Screening.”

Screening means to group people into those who may have problems and those who do not through tests. Health checkups are a form of screening, not a diagnosis of illness. If a child is suspected of some possible health problems in a health checkup, it is important to refer the child to the appropriate health service.

2. Health checkup methods

This section explains procedures for height measurement, weight measurement, eye test, and hearing test, and for evaluating the measurement/test results. Screening can be performed properly without specialized equipment. Check the physical growth and health conditions of children with materials available at your school.

1) Height measurement and weight measurement

(1) Height measurement method

- a. Items for use: Measuring tape, triangle ruler, adhesive tape (**Figure 9.1**)



Figure 9.1 Items for measuring height (triangle ruler, tape measure, and adhesive tape)

- b. Set up the place for measuring height (**Figure 9.2**)
- Look for a **level floor and wall**. Even a pillar will work.
 - Hold the tape measure to the wall, making sure it is **perpendicular to the floor**.
 - Mark the floor where the child's feet should be.



Figure 9.2 Setting up the place for measuring height

- c. Procedure
- Call the names of the children one at a time.
 - Have them remove their shoes.
 - Have them **stand upright** with both heels touching the wall.
 - Make sure **both heels, buttocks, and back are touching the wall**. Be sure that the back of the head touches the wall. (**Figure 9.3**)

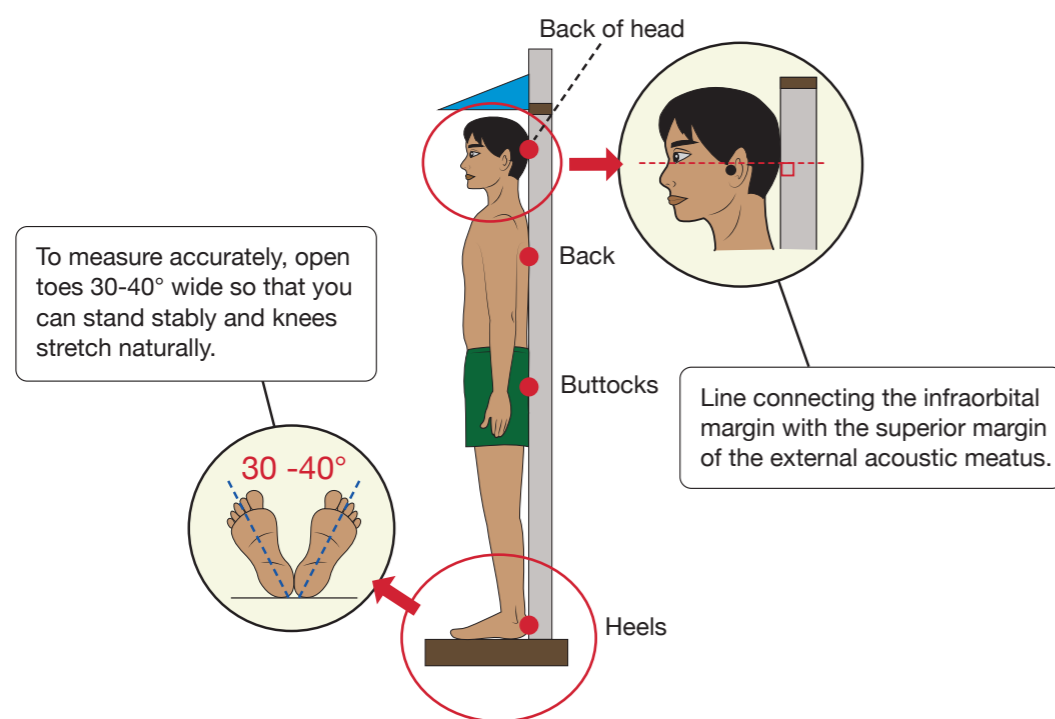


Figure 9.3 The correct posture when measuring height

- Have them hang their arms down the side of the body.
- Have them look straight forward.
- Lower the triangle ruler straight down along the tape measure, read, and note it down the value at the corner of the triangle ruler (**Figures 9.4 and 9.5**).

- d. Tips
- Make sure that the posture of the child is correct during measurement.
 - Measurement may not be accurate for children who tie their hair near the tops of their heads. Ask them for consent to untie or lower the knot.



Figure 9.4 Lowering triangle ruler



Figure 9.5 Scene of measuring height

(2) Weight measurement method

- Items for use: Scale
- Set up the place for weighing
 - Find a **level floor**.
 - Position the scale.
- Procedure (**Figure 9.6**)
 - Call the names of the children one at a time.
 - Have them remove their shoes. Have them take off their jackets and weigh without carrying anything unnecessary, such as mobile phones or watches.
 - Have them **stand gently on the middle of the scale**.
 - Ensure that they do not move while on the scale, and read and note down the number on the scale.



Figure 9.6 Scene of measuring weight

- d. Tips
- The method for turning on and using the scale differs for each scale. Check these methods before starting. For analog scales, make sure that the needle is pointing to 0. For digital instruments, check the batteries.
 - Avoid weighing immediately after eating, as this can affect body weight considerably.

(3) Assessing height and weight

Reference values for comparing measurements are essential for checking the growth and development conditions of an individual, in order to determine if there is any illness or growth bias such as obesity or thinness, and to know the position within the group.¹ **Physique indices** are used for evaluating growth based on height and weight. In addition to **the body mass index (BMI)** discussed in Chapter 6, they include the **Rohrer index, Kaup index**, the degree of obesity, and various other indices. BMI is used for adults worldwide while the degree of obesity and Rohrer index are also widely used for childhood assessment (**Table 9.1**).

However, note that BMI and Rohrer index must be used carefully. First, the formula for calculating BMI is universal, but the criteria for judgment differ by country. For example, BMI ≥ 30 is obese according to the WHO international standard² while ≥ 25 is obese in the Asia-Pacific region.³ Generally, the Rohrer index can be used for children who are 125 cm or taller. However, considering that height changes are complicated during growth from elementary school age to puberty, the Rohrer index may come out higher for children who are short.

Furthermore, given individual differences in childhood growth and development, just measuring how many centimeters a child has grown and how many kilograms the child has gained are not sufficient for appropriate evaluation of growth. For example, a sudden increase in height tends to be welcomed in most children but it may be a sign of precocious puberty (after an early growth spurt where there is a temporary sudden increase in height, growth stops with the body remaining extremely small) or abnormal growth where the body stops growing completely after such sudden growth, both of which require treatment.⁴ For this reason, it is important to not only evaluate the height and weight by simply comparing the previous data, but also to **continuously observe changes**, so as to ensure the sound growth and development of the child without overlooking any abnormal changes.

In the case of physique indices, the reference value differs depending on the age and is useful only for evaluating growth at a single point in time. This means that the value is not an index of continuous growth. Consequently, the use of **growth curves** is recommended for continuously evaluating the growth and development of children.⁵ A growth curve is a graph drawn by collecting measurements of height and weight of many children of various ages by gender, and connecting the average values of each age with a curve. Growth curves of +2SD (SD: standard deviation), +1SD, -1SD, -2SD (or percentile) of the average values are also shown. By entering the measured data of the child in the standard growth curve, you can see how tall or short, how heavy or light the child is. Furthermore, by entering values over time, the growth pattern of the child can be obtained and the progress of growth can be confirmed.

Although there are no currently available growth curves for children in Cambodia, the Foundation for International Development / Relief (FIDR)⁶ has proposed the appropriate height and weight of children (**Table 9.2**). With the spread of health checkups across the country and the accumulation of data on the height and weight of children in the future, it will be possible to create growth curves for children in Cambodia.

Column: What is standard deviation?

The standard deviation is an indicator of how much the distribution of data varies from the overall mean. Assuming that there are data measuring the height of 100 children, it means that about 68% (68 children) of the height data are between +1SD and -1SD. About 96% of the data are included between +2SD and -2SD. This means that children outside the range of + 2SD to -2SD are either very short or very tall and may have health issues.

Table 9.1 Physique indices used for children

Physique index	Calculation method	Suited to	Appropriate values
Kaup index	Weight (kg) / Height (m) ²	3 mo to 5 y	3 mo to <1 y : 16 to <18
			1 y to <1 y 6 mo : 15.5 to <17.5
			1 y 6 mo to <3 y : 15 to <17
			3 y to \leq 5 y : 14.5 to <16.5
Rohrer index	Weight (kg) / Height (m) ³ × 10	Elementary school children - Junior high school students	115–145
Body mass index (BMI)	Weight (kg) / Height (m) ²	Senior high school students and above	18–22

mo=month, y=year

Table 9.2 Appropriate height and weight of children in Cambodian

Appropriate Value for Height (cm)			Appropriate Value for Weight (kg)		
Age (y)	Boy	Girl	Age (y)	Boy	Girl
6	113–117	109–113	6	19–21	16–19
7	116–120	116–120	7	20–23	19–22
8	121–124	119–123	8	21–24	20–23
9	124–128	123–127	9	22–25	22–25
10	128–132	127–131	10	25–28	25–28
11	132–136	134–138	11	27–30	28–31
12	136–140	142–146	12	29–32	32–35
13	142–146	147–151	13	32–35	35–38
14	151–155	150–155	14	38–41	39–42
15	157–161	152–156	15	43–46	44–47

Source: FIDR, 2017⁶

Column: Situation of thinness and obesity in children in Cambodia

In Cambodia, height and weight are used to evaluate the nutritional status of children. Specifically, **malnutrition (nutritional deficiency)** or the state of lacking balanced nutrition for healthy growth are classified into **stunting, wasting, being underweight, and being overweight (Figure 9.7)**. Stunting is assessed by “Height-for-age” and is an indicator of long-term chronic nutritional status.^{6,7} Wasting is assessed by “Weight-for-height” and is often used to evaluate short-term acute nutritional status. Being underweight is assessed by “Weight-for-age,” and being overweight is assessed by “Weight-for-height,” as is done for wasting⁸

According to the Cambodia Demographic and Health Survey 2014,⁸ the nutritional status of Cambodian children has been improving since 2000 with a downward trend in all stunted, wasted and underweight children. However, results of every category differ by state significantly, suggesting contributions of differences between urban and rural areas and between rich and poor. In this way, although the number of overweight children is surging in urban areas, the problem of stunting is significant in Cambodia as a whole. Physiological tests are required for a detailed assessment of nutritional status. However, given that height and weight can be easily measured without discomfort, they can be considered an effective means for evaluating the growth and development status of children.

Normal height for age

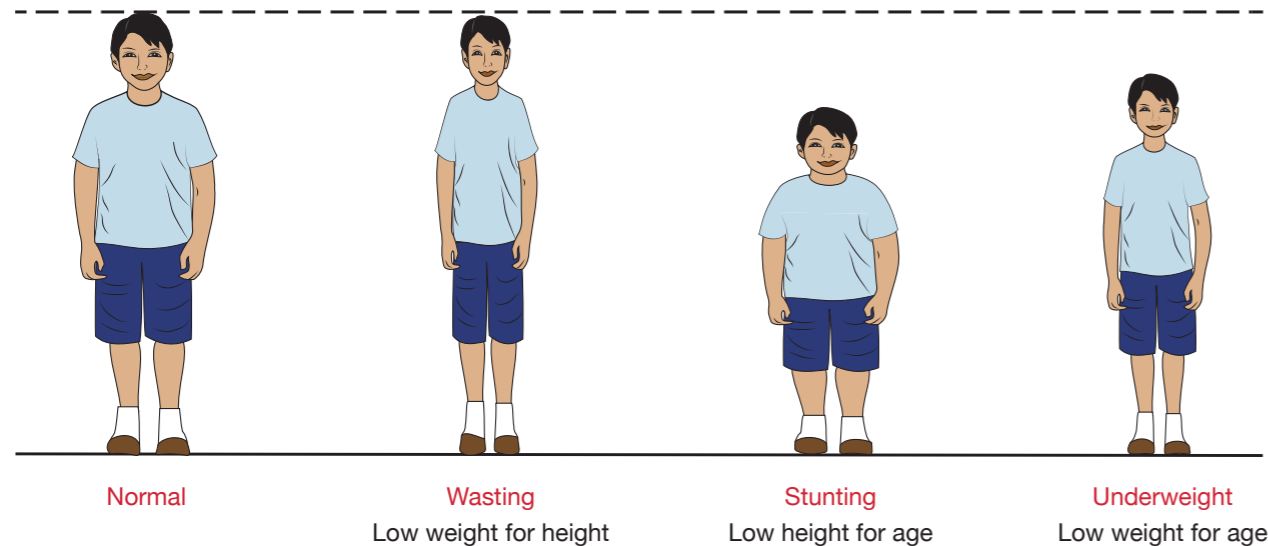


Figure 9.7 Different types of undernutrition

2) Eye test⁹

(1) Eye test method

- a. Items for use: **Eye chart** (see Exhibits for E chart), eye shield (**Figure 9.8**, if no eye shield, gently cover one eye with your own hand or paper)

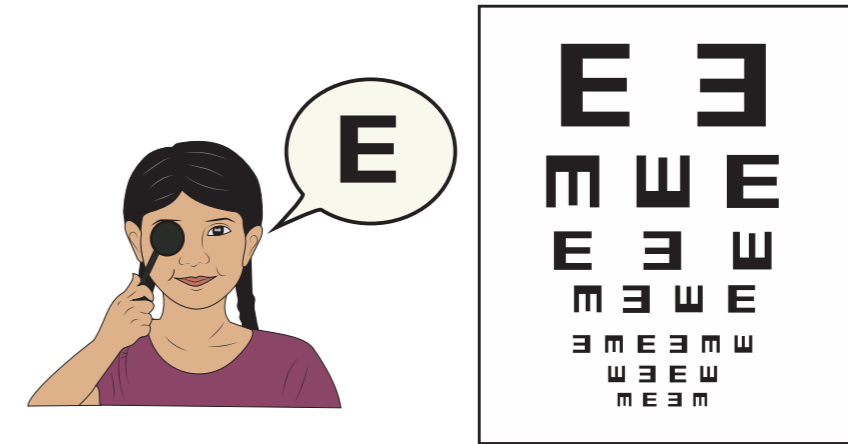


Figure 9.8 Eye shield

- b. Set up the place for performing the eye test
 - (1) Find a bright room that provides a distance of **at least 3 m** (turn on the light / open the window).
 - (2) Fix the eye chart on a wall or pillar with the big E at eye level. Mark the position 3 m from the eye chart to indicate clearly where to stand when taking the eye test.
 - (3) If the test is taken sitting down, prepare a chair that is 3 m from the eye chart.
- c. Procedure (**Figures 9.9, 9.10, and 9.11**)
 - (1) Before the test, explain to the children how to take the eye test in the classroom.
 - (2) Have several children line up at a time for the eye test to **wait quietly** for their turn.
 - (3) Call out their names one by one.
 - (4) Have those wearing eyeglasses to take the test with their eyeglasses on.
 - (5) Have the children stand or sit at a position 3 m from the eye chart (**Figure 9.9**).
 - (6) Have the children point their finger in the direction that E faces. Have them reply “can’t see” or “don’t know” if they cannot see (**Figure 9.11**).
 - (7) Testing the right eye. Tell the children to use an eye shield or something similar to gently hide the left eye. (**Figure 9.11**)
 - (8) **Ask the direction of each large E (6/60).** Record children who get all four directions (up, down, left and right) correct as Pass and all the other children as Fail. Those who fail in the large E test are not eligible for the test using the small Es.
 - (9) For children who passed the test using the large Es, **ask which directions the five small Es face in row (6/12).** Record children who could see 4 out of 5 as Pass, and 3 or less as Fail.
 - (10) Do the same for the left eye.



Figure 9.9 Scene 1 of the Eye test



Figure 9.10 Scene 2 of the Eye test



Figure 9.11 Scene of a student answering which way E is facing

d. Tips

- The eye chart is a tool for measuring human eyesight that can be measured using numbers, letters, and symbols. Here, a method using the E chart is introduced.
- If you do not have an eye shield, you can use your palm or paper.
- The description in this section is based on **the Guidelines for Vision Testing in School** (Department of School Health, Ministry of Education, Youth and Sport, Cambodia 2016).⁹

Column: Single eye chart

This chapter introduces how to test eyesight using an eye chart fixed on a wall or pillar. Sometimes, **a single eye chart** is used according to age and the level of eyesight (Figure 9.12). Since only one symbol is drawn on a single eye chart, children with low vision and/or who are young can answer them without confusion. A single eye chart is also convenient in that it can be hand held and does not require walls or pillars.

The teacher holds the eye chart and measures eyesight as he/she turns it around, but the basic procedure is the same.

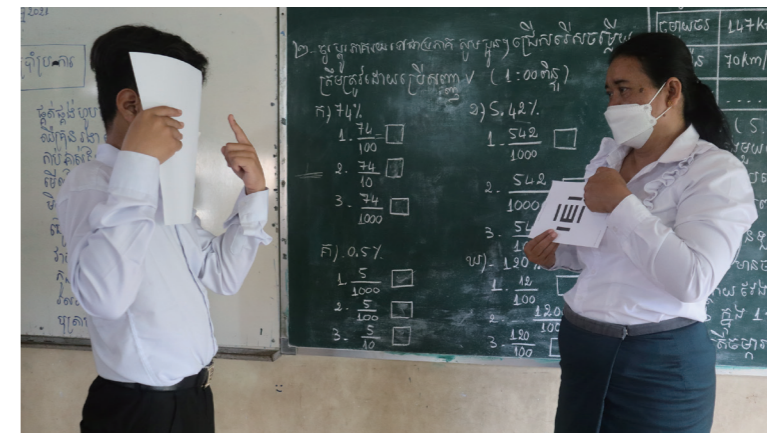


Figure 9.12 Example of the Single eye test chart

(2) Evaluation of eyesight

Refractive errors and diseases of the eyes cause weakening of eyesight. The difficulty in viewing faraway objects reduces concentration and limits activity. Some children may drop out of school because they cannot see the blackboard clearly and fail to keep up with their classes. In Cambodia, many children do not wear eyeglasses. Some children themselves or people around them do not even know that they have poor eyesight because they have never had their eyes tested before.

Eye tests are designed to check eyesight conditions. Examining children's eyesight by eye tests and taking the required action are important for promoting the growth and development of children. In the E chart method introduced in this chapter, it is desirable to be able to see both large Es (6/60) and small Es (6/12). If the children cannot see small Es, it means that their eyesight has deteriorated and a visit to basic eye care services available at 331 health centers (that is, 30% of the total health centers) in provinces, or ophthalmological services available in 21 referral-based hospitals (that is, 23% of the total referral-based hospitals) for an eye test and visual correction if necessary is recommended. If children cannot see a large E, they may have a very serious eyesight impairment and need to consult a medical specialist. However, at present, only 40% of the people in Cambodia have access to eye care services in 10 out of the 25 provinces. Therefore, expanding eye care services and training ophthalmologists are future issues to work on.¹⁰

Eye tests do not reveal the nature of refractive problems such as myopia or hyperopia or the presence of illness. Detailed ophthalmology tests are required. For children with poor eyesight, it is necessary to adjust their learning environment, for example, by setting their seats in the front row of the classroom. Please refer to Chapter 8 for details on eye structure, refractive errors, and diseases.

3) Hearing tests¹¹

(1) Hearing test method

- a. Item for use: Chair
- b. Set up the place for performing the hearing test
Find a quiet room because measurement cannot be performed correctly in a noisy place. Take measures such as closing windows and doors.
Position the chair.
- c. Procedure
 - (i) Call out the names of the children one by one in turn.
 - (ii) Have a child sit on the chair.
 - (iii) Perform a voice test. Ask the child for their name and grade and check if there is any problem with answering. If the answer is good, record it as “Pass.” If there is any problem, record as “Fail.”
 - (iv) Perform a hearing test (**Figure 9.13**). Tell the child to close their eyes and raise their hand on the side where they hear the sound of fingers rubbing together.
 - (v) Rub your fingers together about 5 cm away from the child’s ear. Repeat it on the left and right sides twice each. Record as “Pass” if they can hear and “Fail” if they cannot.



Figure 9.13 Scene of the hearing test

- d. Tips
 - Use the Voice test to check if children have any problems in daily conversation, and the hearing test to check if they can hear weak sounds.
 - Now smartphones have apps for simple hearing tests, which can be used to produce weak sounds in the hearing test.

(2) Evaluation of hearing

Deafness is the condition of not being able to hear sounds or words clearly or at all. It is a serious disorder that interferes with daily life, language development, and knowledge acquisition. Hearing tests are intended to check for the presence of deafness and its degree if any. It is extremely important to detect deafness and take early measures.

The structure of the ear is divided into the **outer ear**, **middle ear**, and **inner ear** (**Figure 9.14**). The

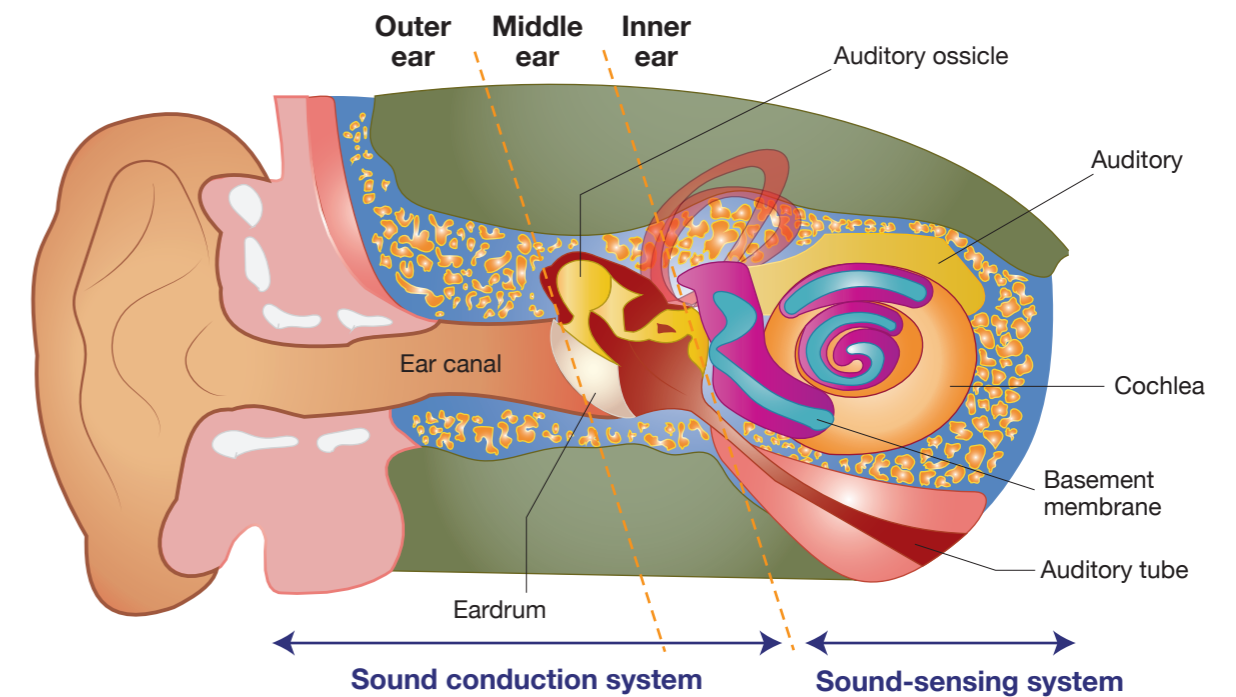


Figure 9.14 Structure of the ear

outer and middle ears play the roles of transmitting sound while the inner ear plays the role of sensing and transmitting sound to the brain. Deafness can be divided into two types: **conductive deafness** caused by poor sound transmission due to disorders of the outer and middle ears, and **sensory deafness** caused by problems with the inner ear that make it difficult to sense sounds. Conductive deafness is caused by otitis media, otitis externa, and cerumen impaction. Sensitive deafness often develops naturally (**congenital deafness**). It also includes **noise-induced deafness** caused by exposure to factory mechanical sounds or construction sounds at work and **acoustic deafness** caused by listening to loud sounds over headphone, etc., for long hours.

WHO warns that 1.1 billion young people around the world are at risk of **acoustic deafness** caused by listening to portable music players and smartphones.¹² Deafness caused by ear disease may progress slowly. In such cases, hearing is not lost overnight, and hence it is difficult for the person and others to notice the condition. Deafness in a child can be suspected not only from the results of hearing tests but also from other symptoms: the child always listens with one ear, turns up the TV volume, sits near the TV, and does not notice people who are out of sight talking. If hearing is poor, the child must see an otolaryngologist or an audiological clinic for a detailed examination.

4) Recording

Keep records carefully and correctly as omissions or mistakes will disable correct evaluation and appropriate screening. To accurately record the measurement results, set up a stand for writing in the recording sheets at each measurement location and deploy a recorder. Use standardized units, such as height in cm (e.g., 156.5 cm) and weight in kg (e.g., 45.5 kg). Regarding height and weight measurements, read to the first decimal place and record it. Be careful not to mistake the left and right sides for vision and hearing results.

The record table (see Supplemental material 2) must have fields for filling out the child's name, gender, age, and date of measurement in addition to the field for entering the measurement results. To facilitate data organization, it may be a good idea to include fields for the child's date of birth, grade/class, and school name. It would be ideal to prepare copies of the records for feedback to children and their families and for storage at the school. It is important to accumulate the results of health examinations not only for screening or cross-sectional evaluation but for **longitudinal evaluation**. For example, by using recording sheets that can keep records for 6 years of elementary school, you can understand the trajectory of the growth situation and characteristics of each student. The analysis of the accumulated data allows you to identify health issues in classes and schools. For details on using recording sheets, please refer to "4. Use of records" in this chapter.

Supplemental materials in the end part of this chapter show some examples of recording sheets. Edit them to a format that is easy to use or create your own recording sheets according to the situation of each school.

3. Practice

1) Flow of health checkups (Figure 9.15)

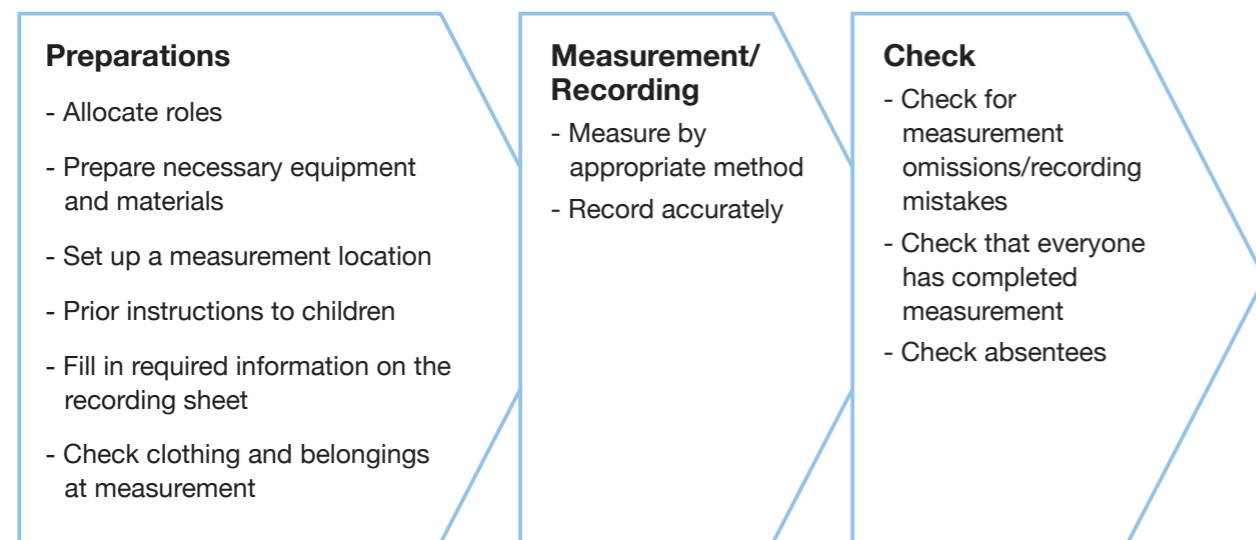


Figure 9.15 Flow of health checkups

2) Let's practice for measurement

Step 1: Let's measure each other

Decide the roles (person measuring, person recording, and measured children) and measure alternately so that everyone has the chance to play all roles. After the measurement, discuss which part was difficult and which should be improved.

Step 2: Let's measure children

- (i) Decide the roles (person measuring, person recording, and person giving instructions).
- (ii) Give prior instructions to children. In order to conduct health checkup smoothly, it is recommended that a prior lecture be given to the children on the purpose and method of health checkup and how to answer the eye test. In particular, explain carefully to children who are taking the measurements/ tests for the first time and younger children.
- (iii) Precautions for measurement
 - Use signboards to indicate where the measurement is carried out. Also show notes on a poster.
 - During the eye test, make sure that the children waiting in the vicinity do not tell the answers to the child being tested.
 - During the hearing test, make sure that the children waiting in the vicinity are not noisy.
 - During the eye and hearing tests, if it is difficult to judge whether the child cannot see/hear or does not know how to answer, ask the child directly.
 - During the eye and hearing tests, **do not laugh or get angry** as it is not wrong to be unable to see/hear.

4. Use of records

Keeping records of each child over time enables tracking of growth longitudinally. The recording sheets should include the height, weight, and other numerical data not only at a single measurement but over time in a graph, and be bound into a healthcare notebook of the records for six years. By providing sections for the children, families, and school to make comments, and having the children bring the healthcare notebook home for families to write comments and then returning it to the school, the children will be able to visually understand their growth, and both the school and family members can keep track as well. Furthermore, by keeping records on eyesight and hearing, comparison of results can be made with those of the last year, consequently the school can provide families with advice on points to note in everyday life, and recommend medical consultation.

Records can not only be kept for saving individual growth but can also be used to statistically analyze the health status of children throughout the school. By comparing the height, weight, and obesity of one's school with national and regional values by age and sex, the health issues of one's school can be clarified and utilized for health education.

Figures 9.16 and 9.17 show the average and standard deviation for height and weight development among boys and girls through ages 6 to 12 years in Kandal Stung County, Kandal Province, calculated from data collected from nine schools that cooperated in the health checkup conducted by NGO Udon House in 2019. For example, the left side of Figure 9.16 shows that between the +1SD and -1SD intervals, there is approximately 68% of the boys in the sample for each age. In the same way, between +2SD and -2SD, approximately 96% of the boys in the sample are counted.

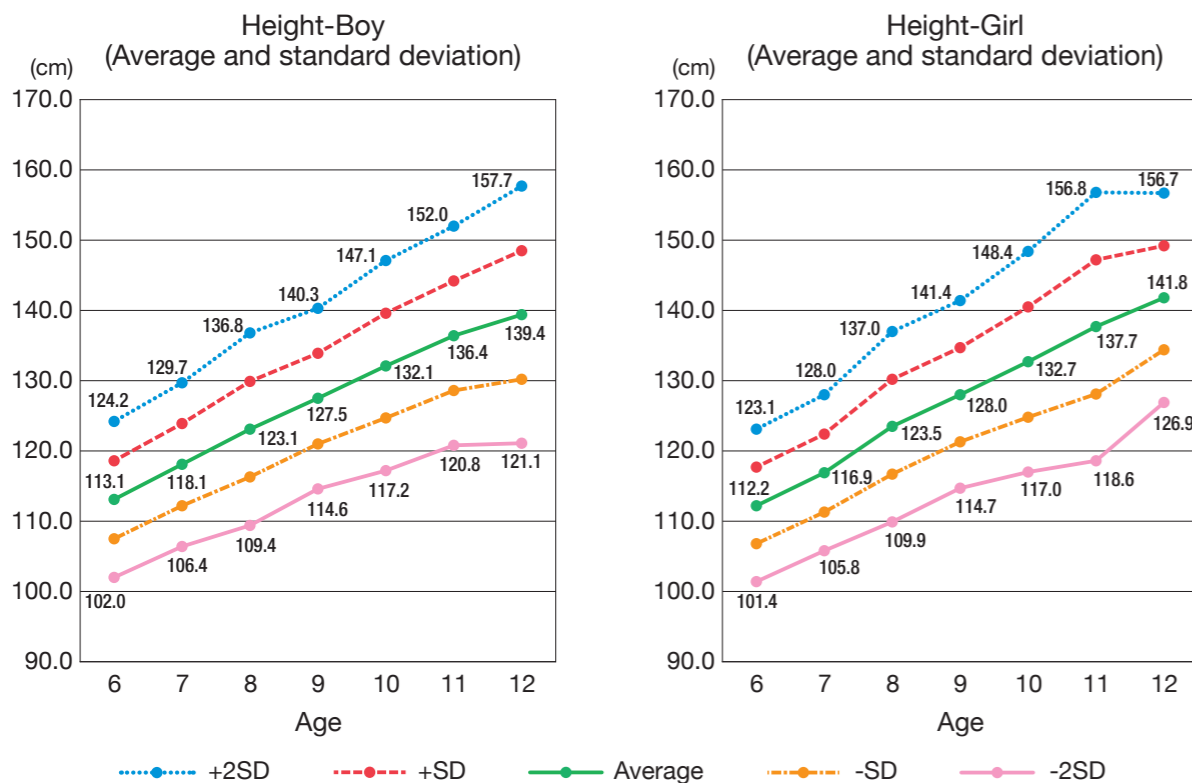


Figure 9.16 Average and standard deviation for height development among boys and girls through ages 6 to 12 years -9 elementary schools in Kandal Stueng County, Kandal Province-

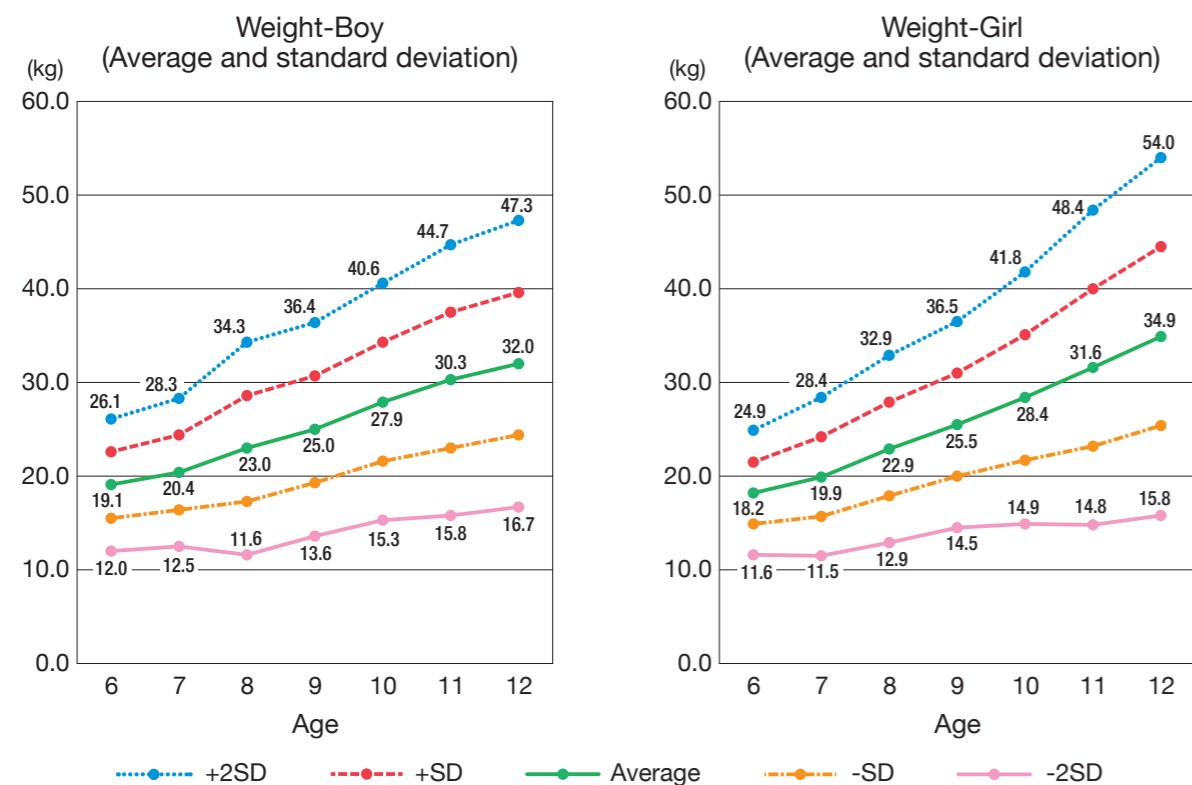


Figure 9.17 Average and standard deviation for weight development among boys and girls through ages 6 to 12 years -10 elementary schools in Kandal Stueng County, Kandal Province-

5. Implementation at schools

1) Importance of creating a school health organization

The understanding of managers and cooperation between teachers are indispensable for health checkups. It is hence important to build a framework within the school. Ideally, teachers should be able to share roles based on a common understanding, and the school should run the system for health checkups as a whole to ensure that checkups are conducted smoothly in a limited amount of time. It is also effective to hold an internal training program for the significance and methods of health checkups or position health checkups as a school event.

It is necessary to draw up an implementation plan according to the size and situation of the school. If the school has only a few teachers or many children, it is not necessary to take all the measurements of all the children at once. The implementation plan should be reasonable and continuously implementable at least once a year at the same time every year. Alternatively, by setting up a permanent health checkup area in the **Health Room**, which is expected to become widespread in Cambodia, health checkup will become more familiar to the children as a habit for them to check their own growth whenever they want. Health checkups serve an important health education opportunity for children to face and understand their bodies and should therefore be made good use of.

Column: Example of activities of Children's Health Club (Figure 9.18)

Since there is a shortage of teachers in Cambodia, it is difficult to conduct health checkups in some schools. One solution is to teach children to run the health checkup program together. By learning how to conduct health checkups and doing it themselves, it will not only reduce the burden on teachers, but also heighten the children's interest in health, encouraging voluntary learning. For example, having older children at the school organize a **Children's Health Club** and teach their classmates and younger children how to take measurements provides the opportunity to think about the health of others and also make new discoveries.

In neighboring Laos, there are elementary schools that actually operate children's health clubs. Children selected as members of the health club are taught by teachers about health checkups. Through repeated practice, they learn how to take measurements and perform tests correctly.

Members have fun measuring the height and weight of friends and younger children, and test their eyesight and hearing. If a younger student of an ethnic minority who does not understand the Lao language has difficulty taking the measurements and tests, an older student of the same ethnic group will explain the tests thoroughly in the ethnic language, helping the younger student understand the procedure and take the health checkup smoothly.

For the Children's Health Club to work, teachers must first understand the significance and methods of health checkups. Teaching children and getting them involved in activities takes a lot of time. But once these efforts take root, it will be a meaningful initiative that facilitates the management of health checkups and deepens children's learning.



Figure 9.18 Scene of a children's health club (Laos)

2) Example of implementation (Plan – Implementation – Evaluation)

When you conduct health checkup in your school, you can refer to an example of the procedure for health checkup in school described in Table 9.3.

Table 9.3 The flow of from planning to evaluation of health check-up in school

Date/Implementation stage	Main details	Example	
Plan			
More than 1 week before	<ul style="list-style-type: none"> ▶ Prepare implementation plan 	<ul style="list-style-type: none"> ● Consider the date and time and implementation method. Examples of methods include measuring by grade or type over several days, or measuring all children over one day. ● Check the roles of teachers on the day. ● Check the equipment and items required on the day. ● It is advisable to set aside a day to train teachers about health checkups, and/or a day to give prior instructions to children, apart from the day of the measurement/test according to the school situation. 	<ul style="list-style-type: none"> ● Date and time: HH:MM to HH:MM on MMDD, HH:MM to HH:MM on MMDD. ● Implementation method: Perform all four measurements/ tests on all grades. ● Role: 6 persons carrying out measurements, 6 to record values, and two guides ● One place each for measuring weight, measuring height, and performing hearing test respectively. Two places for performing eye tests as it takes time. ● Give prior instructions to children on the day before.
	<ul style="list-style-type: none"> ▶ Decide place for performing measurements/ tests 	<ul style="list-style-type: none"> ● Find a suitable place for measurements. Pick a place where the health checkup can proceed smoothly. 	<ul style="list-style-type: none"> ● Appropriate places were selected assuming that the measurements will be carried out in the order of weight → height → eye test → hearing test.

Date/Implementation stage	Main details	Example	
Implementation			
Preparation			
<ul style="list-style-type: none"> ▶ Prepare required items 	<ul style="list-style-type: none"> ● Prepare the necessary items for measurements and check if they can be used without problems. ● Print the recording sheets. 		
<ul style="list-style-type: none"> ▶ Provide prior instructions 	<ul style="list-style-type: none"> ● Check the purpose and method of the health checkup, and points to note in measurements. By practicing how to take the eye tests in advance, the test on the day will proceed smoothly. ● Instruct children to fill in the required information on the recording sheet. In the lower grades, teachers can fill in them on their behalf beforehand. ● Check clothing and belongings when taking the health checkup. 		
<ul style="list-style-type: none"> ▶ Set up the place to carry out measurements/ tests 	<ul style="list-style-type: none"> ● Use posters and signboards to indicate where the health checkup place is according to the situation of the school. 		
Measure/record			
Day before–day of measurement/ test	<ul style="list-style-type: none"> ▶ Perform measurements 	<ul style="list-style-type: none"> ● Measure according to an appropriate method. ● Call children's attention if necessary. ● Prevent confusion among the children by having them line up, calling their names first before measurement, and placing guides. 	<ul style="list-style-type: none"> ● Precautions on height measurement: Have children adopt a hairstyle suitable for measurement. ● Precautions on weight measurement: Have children take off their jacket and take out everything from their pocket. ● Precautions on eye test: Make sure that children waiting in the vicinity do not tell those who are taking the test the answers. ● Precautions on hearing test: Make sure that children waiting in the vicinity do not make noise.
	<ul style="list-style-type: none"> ▶ Take records 	<ul style="list-style-type: none"> ● Write the results in the correct fields. ● Be careful not to make errors in writing. 	<ul style="list-style-type: none"> ● Record weight in “kg” and height in “cm.”
Check			
	<ul style="list-style-type: none"> ▶ Check 	<ul style="list-style-type: none"> ● Check for omissions or errors in measurements entered. ● Check that everyone has been measured/tested. ● Make arrangements for absentees to take the health checkup on a later day. 	

Date/Implementation stage	Main details	Example	
Evaluation			
Next day and afterwards	▶Perform screening	<ul style="list-style-type: none"> ●Based on the results of health checkups, identify student with health problems. ●Continue to keep records and create graphs for future evaluations. 	<ul style="list-style-type: none"> ●Height / Weight: Evaluate physique and growth. ●Eye test: Check for refractive problems and visual impairment, and the degree of interference with daily life. ●Hearing test: Check for hearing loss or impairment, and the degree of disability in daily life.
	▶Follow-up	<ul style="list-style-type: none"> ●Support at school: Improve learning environment, provide follow-up, provide health education, and report to parents. ●If necessary, advise parents to consult a health center, or a clinic. 	<ul style="list-style-type: none"> ●Support for students with weakening eyesight: Set their seats in the front row in the classroom. Check their posture during class. Check if they can see writing on the blackboard clearly during class. Provide health education on the use of smartphones. If school support is not enough, encourage parents to make eyeglasses for their children or visit basic eye care services at provincial health centers or ophthalmological services in referral-based hospitals.

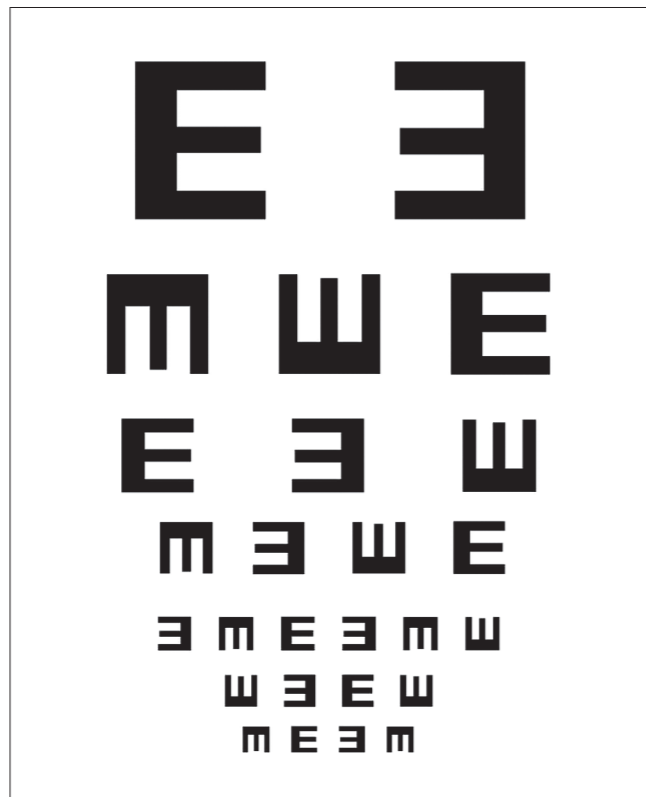
Exercises for further thought and research

- [9-1] Use your height and weight to calculate your BMI.
- [9-2] Share what you found difficult or noticed when measuring children. Also, calculate the average height and weight from the measurement results and compare them with the appropriate values indicated by FIDR (Table 9.2) and the average value of Kandal Stueng County (Figures 9.16 and 9.17). Calculate the Rohrer index with the children.
- [9-3] Make a preliminary guidance plan for children. How can you convey the purpose and significance of health checkups, measurement methods, and precautions to children in an easy-to-understand manner?

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Supplemental materials (Suppl.)



Suppl 9.1 E chart

✓...No problem

Name	Sample		Sex	Male	Date of Birth				12/25/2009					
Academic Year	2015-2016		2016-2017		2017-2018		2018-2019		2019-2020		2020-2021			
Grade and Class	Grade 1A		Grade 2A		Grade 3A		Grade 4A		Grade 5A		Grade 6A			
Month	Nov	Apr	Nov	Apr	Nov	Apr	Nov	Apr	Nov	Apr	Nov	Apr	Nov	Apr
Age	6	7	7	8	8	9	9	10	10	11	11			
Height	115.0	118.5	121.5	124.0	127.5	130.0	133.5	136.0	140.0	143.0	145.5			
Weight	20.0	22.0	23.5	26.5	28.0	29.0	32.5	33.5	35.0	36.5	37.5			
Eyes	R	✓	✓	✓	✓	✓	✓	Small E	Small E	✓	✓	✓		
	L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Ears	R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Other										Glasses	Glasses	Glasses		

Health Checkup Recording Sheet (For individual data)

✓...No problem

Name	Sample		Sex	Male	Date of Birth									
Academic Year														
Grade and Class														
Month	Nov	Apr	Nov	Apr	Nov	Apr	Nov	Apr	Nov	Apr	Nov	Apr	Nov	Apr
Age														
Height														
Weight														
Eyes	R													
	L													
Ears	R													
	L													
Other														

Suppl 9.3 Recording sheet for individual data

Health Checkup Recording Sheet (For class)

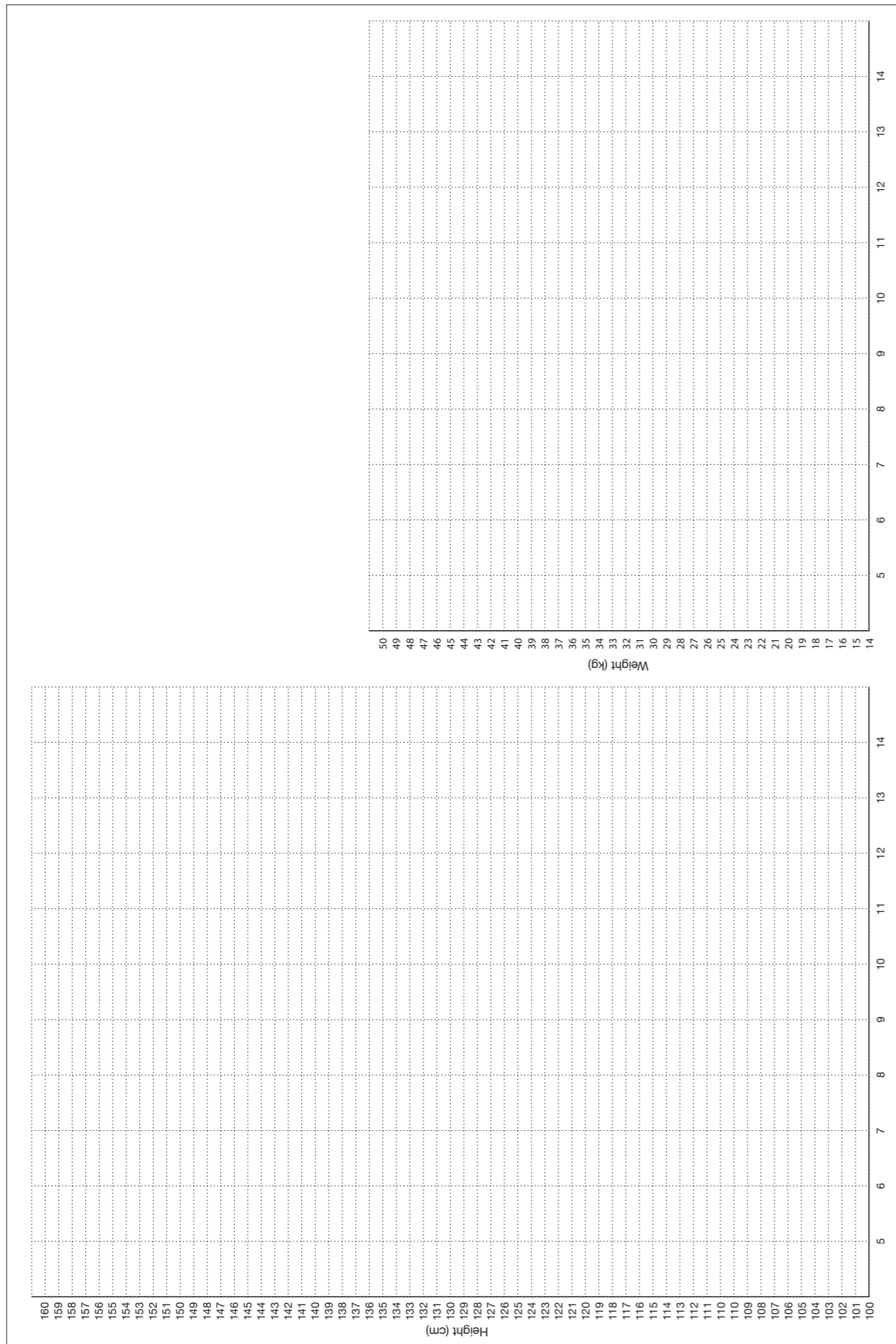
Academic Year: _____

Grade and Class: _____

✓...No problem

No.	Name	Sex	Age	Date of Birth	Height (cm)		Weight (kg)		Eye(R)		Eye(L)		Ear(R)		Ear(L)		Other
					Nov	Apr	Nov	Apr	Nov	Apr	Nov	Apr	Nov	Apr	Nov	Apr	
Ex	Sample	F	11	12/24/2009	140.5	145	35.0	37.5	✓	✓	✓	Small E	✓	✓	QS test	✓	
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Suppl 9.2 Recoding sheet for class



Suppl 9.4 Recoding sheet for graphing

Date of Today: _____

Name: _____ **Age:** _____ **Sex:** Male Female

Date of Birth: _____ **Grade and Class:** _____

Height: _____ CM Weight: _____ KG

Eyes: Large E <Right> Normal Impaired <Left> Normal Impaired
 Small E <Right> Normal Impaired <Left> Normal Impaired

Ears: Voice T <Right> Normal Impaired <Left> Normal Impaired
 Hearing T <Right> Normal Impaired <Left> Normal Impaired

----- Cutting off -----

Date of Today: _____

Name: _____ **Age:** _____ **Sex:** Male Female

Date of Birth: _____ **Grade and Class:** _____

Height: _____ CM Weight: _____ KG

Eyes: Large E <Right> Normal Impaired <Left> Normal Impaired
 Small E <Right> Normal Impaired <Left> Normal Impaired

Ears: Voice T <Right> Normal Impaired <Left> Normal Impaired
 Hearing T <Right> Normal Impaired <Left> Normal Impaired

----- Cutting off -----

Date of Today: _____

Name: _____ **Age:** _____ **Sex:** Male Female

Date of Birth: _____ **Grade and Class:** _____

Height: _____ CM Weight: _____ KG

Eyes: Large E <Right> Normal Impaired <Left> Normal Impaired
 Small E <Right> Normal Impaired <Left> Normal Impaired

Ears: Voice T <Right> Normal Impaired <Left> Normal Impaired
 Hearing T <Right> Normal Impaired <Left> Normal Impaired

----- Cutting off -----

Date of Today: _____

Name: _____ **Age:** _____ **Sex:** Male Female

Date of Birth: _____ **Grade and Class:** _____

Height: _____ CM Weight: _____ KG

Eyes: Large E <Right> Normal Impaired <Left> Normal Impaired
 Small E <Right> Normal Impaired <Left> Normal Impaired

Ears: Voice T <Right> Normal Impaired <Left> Normal Impaired
 Hearing T <Right> Normal Impaired <Left> Normal Impaired

Suppl 9.5 Recoding sheet: brief version