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# Children's Nutrition Education Integrated with Traditional Chinese Culture

A Social Impact and Sustainability Concept of a Dietary Program Based on the Twenty-Four Solar Terms



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## Abstract

In today's society, there is a growing concern about children's eating habits. The issue of environmental sustainability has also gained prominence. This design research explores the health and environmental impacts of children's eating and aims to foster healthy eating habits. By advocating fruit and vegetable consumption, especially when they are seasonal, design interventions can encourage children to eat healthier, improve physical health while also raising awareness of a sustainable lifestyle manifested through Chinese cultural heritage and traditions.

This visual communication design project, *24 Treasures*, creates a collectible card series that draws on traditional Chinese culture and combines the concept of the 24 solar terms to promote healthy seasonal eating. During each solar term, children can not only learn more about the corresponding seasonal fruits and vegetables, but also experience fun engagement and incentives through the collection card rewards. The card series guides children through education and practice.

*24 Treasures* represents an important step in fostering healthy eating habits, environmental awareness and cultural appreciation among children. This also aligns with the Chinese government's sustainable goals.

*Keywords: sustainable development, seasonal fruits and vegetables, 24 solar terms, traditional Chinese culture education, children's food education*

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# Chapter 1. Introduction

## 1.1 Project Background

Contemporary society faces severe environmental crises, with issues such as climate change and resource depletion necessitating a reevaluation and adjustment of our lifestyles. To meet the needs of present generations without compromising the needs of future generations, the United Nations World Commission on Environment and Development introduced the concept of "sustainable development" in 1987 (UN). This concept calls for the harmonious development of society, economy, and environment to address current sustainability issues.

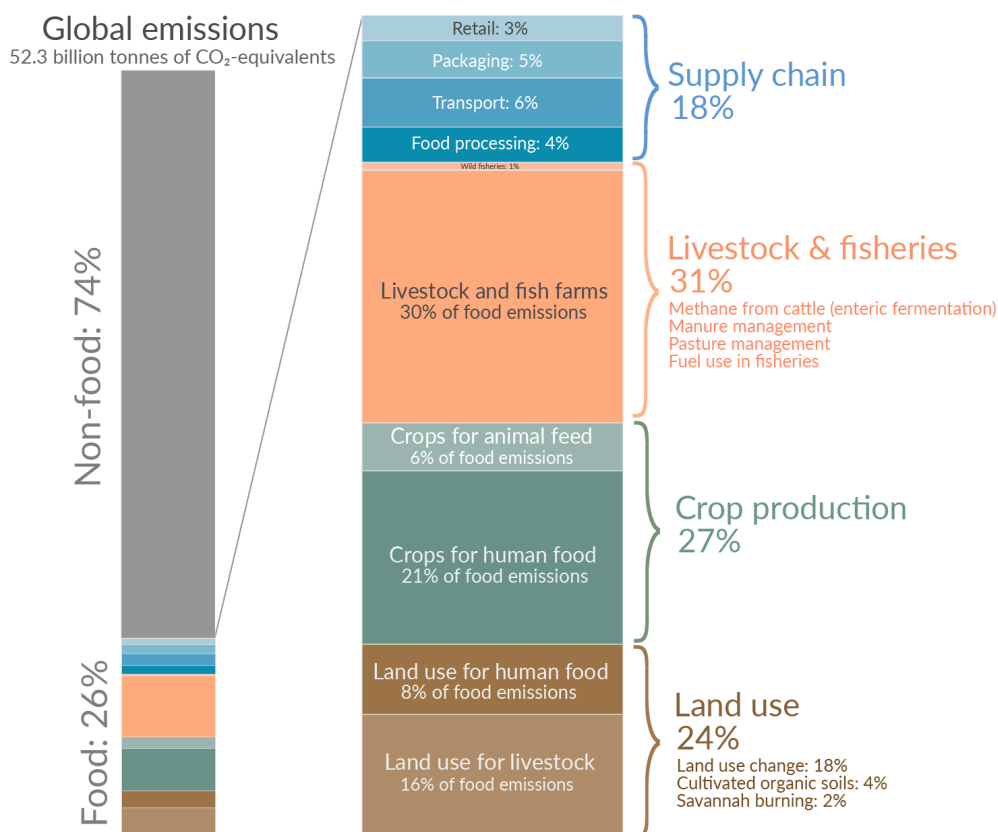
Among the various sustainable development aspects, dietary patterns play a significant role as they not only impact our health but also influence the use of earth's resources and our environmental future. Food that is produced in a problematic and unsustainable manner poses a threat to both individuals and the planet. In 2021, it is estimated that approximately 702 to 828 million individuals, or 8.9 to 10.5 percent of the global population, will experience hunger—an increase of 150 million since the COVID-19 pandemic began (Fan and Meng). These data highlight the inadequacy of current food production to meet the needs of the population and, consequently, underscore the urgency of adopting sustainable lifestyles in all countries.

More individuals are consuming unhealthy diets, resulting in premature mortality and morbidity. In 2017, approximately 11 million people worldwide died from diet-related causes, as per data analysed in the Global Burden of Disease Study 2017. This study aimed to investigate diets across 195 countries globally, with a particular focus on adults aged 25 years and older, and found that these causes primarily include high salt intake, insufficient consumption of whole grains, and inadequate fruit intake (Ashkan et al. 1958). Moreover, a growing number of individuals are consuming low-quality food, leading to micronutrient deficiencies and a notable rise in the prevalence of food-related obesity and non-communicable diseases such as coronary heart disease, stroke, and diabetes. It is worth noting that unhealthy diets pose a greater threat to health than unsafe sex, alcohol, drugs, and smoking combined

(Willett et al. 447). These findings underscore the urgent need to improve global dietary habits to reduce mortality from non-communicable diseases.

Additionally, global food production represents the most significant human harm to the planet. The impacts of food production on greenhouse gas emissions, nitrogen and phosphorus pollution, biodiversity loss, and water and land use further exacerbate the instability of the Earth system (Willett et al. 448). According to a UN-supported study, the food system contributes to more than one-third of the world's total anthropogenic greenhouse gas emissions. Specifically, food production accounts for a quarter of global greenhouse gas emissions (Fig. 1), with food products contributing to approximately 26 per cent of these emissions (Hannah).

## Global greenhouse gas emissions from food production Our World in Data



Data source: Joseph Poore & Thomas Nemecek (2018). Reducing food's environmental impacts through producers and consumers. Published in Science. Licensed under CC-BY by the author Hannah Ritchie (Nov 2022).

*Fig. 1. Poore Joseph and Thomas Nemecek. "Reducing Food's Environmental Impacts Through Producers and Consumers." Science, vol. 360, no. 6392, June 2018, pp. 987-992.*

In the last decade, an increasing number of nations have started to factor sustainability into their food-related policies and consumer guidelines. The Food and Agriculture Organization of the United Nations (FAO) in 2010 introduced the notion of "sustainable diets"—diets that are environmentally benign and contribute to both food and nutritional security, as well as to the health of current and future populations (FAO). Following this, in 2019, the EAT-Lancet Commission on Sustainable Healthy Diets recommended the amalgamation of healthy and sustainable diets into a single, comprehensive framework (Fan and Meng).

There exists a global consensus regarding the significance and urgency of transitioning towards sustainable and healthy diets. According to the 2012 Report on the State of Food Security and Nutrition in the World, by 2030 all countries must shift to sustainable healthy diets to reduce health and climate change costs (Fan and Meng). Sustainability has been a crucial core and strategic aspect of Food-Based Dietary Guidelines (FBDGs), particularly concerning nutrition and the environment. The Foodborne Dietary Guidelines and Sustainability, as delineated by the FAO, advocate for a diet that is primarily plant-based, centred on seasonal and local produce, and aims at reducing food waste. Additionally, they recommend a decrease in the consumption of red and processed meats, highly processed foods, and sugar-sweetened beverages (FAO).

In recent years, obesity has emerged as a major public health challenge confronting China. Over the past four decades, rates of overweight and obesity have experienced a sharp increase. According to Chinese data, from 2015 to 2019, the nationwide prevalence of overweight was 6.8 percent and obesity was 3.6 percent among children under the age of 6, while among children and adolescents aged 6 to 17, the prevalence of overweight was 11.1 percent and obesity was 7.9 percent. The prevalence of overweight and obesity varies by sex, age group, and geographic location but is prevalent across all subgroups. Studies indicate a strong association

between overweight and obesity and the risk of major non-communicable diseases and premature death in the Chinese population (Pan et al., 1). The impact of overweight and obesity may be compounded by economic development, socio-cultural norms, and policies related to urbanisation, city planning, the built environment, the food system, and the environment (Xiong). As China's long-term population growth trend slows, strategies focusing on children's nutrition and health will need to adapt. In China, the challenge of overnutrition is prominent, underscoring the importance of implementing measures to control overweight and obesity as a critical task both presently and in the future (Zong et al., 12).

## **1.2 Research Question**

“How did indigenous knowledge historically inform eating habits and how can communication design help re-trace these steps for a more sustainable lifestyle for today’s society?”

"How can incorporating traditional seasonal dietary practices into modern educational programs promote sustainable food consumption and cultural heritage preservation among children?"

## **Chapter 2. Context Review**

### **2.1 Food and Environment**

In China, over half of consumers exhibit a strong preference for meat, with approximately 60 percent expressing a liking for meat products and deeming them essential (Grimmelt et al.) This proportion notably surpasses that of European nations, emphasising China's position as a traditional "meat-eating" country where meat products dominate the dining table (Hong et al.). The Chinese populace's affinity for meat resembles that of Americans. Furthermore, Chinese and American consumers demonstrate less inclination to reduce meat consumption compared to their European counterparts. Among those open to trying vegetarian diets, the percentage of individuals in China and the United States willing to restrict their meat intake in the future is nearly 20 points lower than in European nations (Hong et al). Vegetables are not only an essential component of a healthy diet but also possess environmentally friendly and sustainable characteristics. Therefore, there is a need to enhance the importance and promotion of vegetables to balance the impacts of meat consumption and promote the development of healthy diets and environmental sustainability.

Before China's reform and opening-up in the late 1970s, meat was considered a luxury item for most Chinese families due to scarcity, resulting in relatively low meat consumption. With China's rapid economic development and subsequent improvement in people's living standards, meat has become increasingly accessible and affordable. Nowadays, many people have increased their consumption of meat products to enjoy a sense of luxury. This "compensatory psychology" and "overconsumption psychology" are responses to the previous period of material scarcity and a pursuit of wealth and enjoyment (APA). However, Chinese consumers are now consuming large quantities of meat without considering health implications. Especially for those who experienced hunger and deprivation in earlier years, a diet without meat symbolises hunger and malnutrition. Most people consider meat to be a nutritious food, and avoiding meat is perceived to lead to weakness or even illness (Cao; daxue consulting, 2019). In Chinese, there is a commonly used phrase when

men are fighting or arguing: "wo bu shi chi su de!" Literally translated as "I'm not vegetarian!" The real meaning is: "I am not a weak person, but a vigorous and manly man, so don't provoke me." (Cao 2).

On June 12, 2020, the outbreak of COVID-19 at Beijing's Xinfadi vegetable market has once again brought fresh attention to meat. China's meat consumption market has been affected several times in recent years by different viruses, such as influenza A (H1N1) in 2009, avian influenza A (H7N9) in 2013, and African swine fever in 2019. In addition to the virus problem, the meat market also presents food safety hazards such as water-injected meat, hormone and antibiotic farming, and the abuse of additives, all of which impact human health (Ma).

For China's urban middle class, the risks associated with meat consumption are not limited to food safety but also extend to body shape and healthy eating. Eating too much meat can result in changes in body shape and nutritional imbalance, prompting more and more people to reconsider the necessity of consuming meat. Additionally, the consumption of meat, such as livestock and poultry, also has a serious environmental impact. The United Nations advocates for reducing meat consumption, and the Chinese government is gradually guiding a balanced intake ratio of animal protein and plant protein to promote the diversification of protein intake channels (Ma).

With growing awareness of health and environmental sustainability, food education has become increasingly important. Through food education, we can change people's stereotypes about vegetables and meat, educate them about the importance of seasonal vegetables, and the benefits of a diversified diet for health and the environment.

Additionally, in 2016, the Chinese Ministry of Health released new dietary guidelines advocating for a 50% reduction in meat consumption (Zhang). This recommendation aims to promote sustainable development based on the current nutritional status and health needs of Chinese residents, as well as scientific evidence for preventing

chronic diseases. This initiative reflects concerns for individual health as well as considerations for societal and planetary sustainability.

According to data analysed in the Global Burden of Disease Study 2017, which was designed to investigate diets in 195 countries around the world, with a particular focus on adults aged 25 and over, about 11 million people worldwide died from diet-related causes in 2017. Mainly, these causes included high salt intake, inadequate whole grain intake, and inadequate fruit intake. These findings underscore the urgency of improving global dietary habits to reduce mortality from non-communicable diseases (Ashkan, et al. 1958).

As modernization advances, the environmental crisis brought about by industrial civilization has prompted people to gradually contemplate and reflect. In 1987, the United Nations World Commission on Environment and Development released a report titled "Our Common Future," which introduced the concept of "sustainable development" for the first time (Emas 1). The idea of "harmony between heaven and humanity" is considered an effective model for achieving harmonious coexistence between humans and nature (Wang). However, in Chinese traditional culture, does the value of "harmony between heaven and humanity" help to alleviate the conflicts between humans and nature in modern society? Can we draw wisdom from "harmony between heaven and humanity" to guide design opportunities to aid modern society? In 2016, the twenty-four solar terms were included in the Representative List of the Intangible Cultural Heritage of Humanity, and they have had an impact not only in various regions of China but also in many countries such as Japan, North Korea, and South Korea. Different countries need to flexibly apply the twenty-four solar terms (MCTPRC). The twenty-four solar terms have a certain universality and can be applied to some high-latitude areas in our country and even the southern hemisphere. For example, in New Zealand in the southern hemisphere, a lunar calendar for the southern hemisphere (with the solar terms opposite to China) can be created to better arrange agricultural activities and celebrate traditional festivals. Dietary and health practices can also be adjusted according to the local climate characteristics to align with the principles of the twenty-four solar terms.

Although it is not considered the primary guiding knowledge for agricultural production in modern times, it remains a symbol of the evolving relationship between humans and nature in agricultural civilization. It can evoke our memories and remind us that nature is changing according to its rhythm. The twenty-four solar terms are the crystallisation of the relationship between the Chinese people and nature. This provides a strong basis for this visual design research.

## **2.2 Dietary Habits and Nutrition Education**

Chinese diets and food consumption patterns have undergone significant changes, driven by substantial income growth, market development, urbanisation, and globalised lifestyles. Concurrently, China is experiencing a rapid increase in food-related health issues, including malnutrition, micronutrient deficiencies, and overweight and obesity. The rise in food consumption away from home, the growing demand for fast food and processed food, and the adoption of Western-style diets in urban areas are all contributing to the swift transition of Chinese consumers from lean to obese (Yuan 143). Consequently, non-communicable diseases (NCDs) such as diabetes, cardiovascular disease, and cancer have emerged as the most severe health threats in China (Budreviciute 4). Over the past decade, approximately 41 million people have died annually from NCDs, accounting for 71 percent of global deaths. NCDs are closely linked to various modifiable risk factors, including high blood pressure, tobacco use, diabetes, physical inactivity, obesity, and high blood cholesterol (Budreviciute 2). However, China is grappling with both NCDs and micronutrient deficiencies, largely attributed to shifts in the dietary habits of the Chinese population. Education can play a more crucial role in influencing dietary balance and nutritional quality (Chang 1). These health challenges underscore the significance of dietary education, which should be considered a key measure in preventing obesity, nutritional imbalances, and related non-communicable diseases (Chang 1).

In Chinese adolescents and children aged 6-14, two dietary patterns are observed: the Traditional Chinese Diet (TCD) and the Modern Diet. The TCD typically advocates for a healthy oriental diet low in salt, highlighting the consumption of soy products, aquatic

products, dairy, fruits, and vegetables (Ma 396). Varied dietary recommendations are tailored to different age groups. A gradual shift in the dietary habits of Chinese children and adolescents from the traditional to the Western pattern—characterised by animal-based foods, desserts, and fast foods—has led to a rise in obesity and overweight cases. This shift also correlates with increased risks of hypertension, chronic kidney disease (CKD), and cardiovascular disease (CVD), attributed to the long-term excessive intake of sodium. Such intake can disrupt the dynamic balance of bone and calcium metabolism, resulting in calcium loss. Consequently, a diverse diet enriched with dairy, fruits, and vegetables is advised for adolescents aged 7-12 (Ma 399), which is deemed beneficial in preventing chronic conditions, including cardiovascular diseases, diabetes, and certain cancers.

Fifty-four studies found that traditional Chinese dietary patterns were negatively associated with later obesity (Niu 1), while modern dietary patterns were positively associated with later obesity. Rice and leafy vegetables were consistently reported as the food groups characterising the traditional Chinese diet (TCD) in at least 75% of the studies; the most frequently mentioned foods were white rice, spinach, Chinese cabbage, and cabbage (Niu 5). Adequate intake of vegetables and fruits is conducive to healthy growth and development in children, while insufficient intake can increase the risk of obesity, high blood pressure, heart disease, and tumours in children and their adulthood. Although vegetables and fruits are essential to people's health and are a key recommendation of dietary guidelines in various countries, inadequate intake of vegetables and fruits is more common among children and adolescents worldwide (Xu 510). This demonstrates the importance of dietary patterns in late childhood obesity and lays the groundwork for culture-specific interventions to reduce childhood obesity rates. Therefore, measures should be taken to avoid modern dietary patterns such as consumption of fried foods, processed meats, and high-energy foods, while encouraging traditional Chinese dietary patterns (Zhen 7). Increased adherence to the traditional Chinese diet (TCD) could reduce the increasing prevalence of NCDs (Niu 5).

The *Chinese Children and Adolescents Nutrition and Health Guidance Guidelines* (2022) and the *Scientific Research Report on the Chinese Resident Dietary Guidelines*

(2021) show that the overall dietary quality of Chinese children and adolescents aged 6-17 has improved, but there is insufficient intake of vegetables, fruits, eggs, dairy products, soy products, and excessive intake of cooking oil and salt, which exceeds the recommended dietary guidelines (Wen). The vegetable and fruit intake of Chinese children and adolescents aged 6-17 is insufficient, and the consumption rate of fruits is low. Education level, region (north-south), and per capita family income, are influencing factors affecting the achievement of minimum fruit and vegetable intake for children and adolescents aged 6-17. Health education and health promotion interventions should be implemented to increase vegetable and fruit consumption (Li).

Yang Yuexin, Chairman of the Chinese Nutrition Society, expressed concerns that: "Vegetable consumption among Chinese residents is generally decreasing, while meat consumption is increasing, with nearly half of the population not consuming fruits." According to the China CDC's "China Nutrition and Chronic Disease Status Report (2020)", the prevalence of overweight (including obesity) among children under six years old in China is 10%, and among children aged 6-17, it is 19%. Without targeted action, the threat posed by childhood obesity could have serious short-term and long-term consequences, leading to chronic diseases, disabilities, and even death. Excessive intake of sugar, fat, and calories from food and beverages over a long period is the main cause of overweight and obesity in children (UNICEF). Therefore, children's food education has become an important task.

It would be useful to promote children and adolescents' food education in classrooms and households, forming a guidance point for health promotion. Through education on dietary hygiene, dietary safety, and balanced nutrition s, people can develop a concept of dietary safety and cultivate good dietary habits to achieve the goal of comprehensively improving health literacy.

Food education as an effective method for developed countries to improve the health literacy of their citizens has long been a consensus in the field of children and adolescent diet research in China. Great efforts have been made to promote food education work, which is not only an educational endeavour but also a systemic

project involving the state, enterprises, social organisations, and families. It is an effective means to improve the overall physical fitness of the population, reduce diseases, enhance the quality of the population, and enhance the soft power of the country (Xia et al.).

Cartoon images play an important role in children's worlds, not only as symbols of entertainment but also as influencers of their cognition and behaviour (Ghilzai et al. 104). For example, the image of Popeye the Sailor positively influenced children by stimulating their interest in vegetables and encouraging them to eat more. Therefore, the cartoon image of Popeye can be seen as a form of implicit food education that conveys the importance of healthy eating to children in a fun and entertaining way, setting a good example for their diet.

Avatars are frequently used as pedagogical tools when designing learning environments for children. This is attributed to children's inherent fondness for avatars, which naturally draws them into the enjoyment of playing or learning with them. Such interactions not only enhance the enjoyment of learning but also aid in establishing an emotional connection between children and the content, thereby facilitating the digestion and absorption of knowledge (Xia 1).

By capturing children's attention and boosting their motivation to learn, virtual characters contribute to creating positive learning environments and enhancing children's learning outcomes (Theng and Pyae 45). Consequently, this project maximises the utilisation of avatars as a teaching resource to provide children with a more enriching, engaging, and effective learning experience.

One reason why Popeye becomes stronger by eating spinach instead of other foods is because the show was said to be sponsored by spinach companies, aiming to encourage people to buy and eat more spinach. After the broadcast of "Popeye the Sailor," spinach sales in the United States increased by 33%, reviving the entire spinach industry. Because of this cartoon, spinach has become synonymous with nutrition and has gained widespread recognition (LivsHealthyLife). Children learn moral messages by watching cartoon characters and develop "wishful thinking" about these

characters, meaning they want to imitate or become their favourite cartoon characters (Robert and George 12). Thus, cartoon characters have a very strong influence on children. Therefore, projects can consider using cartoon characters to convey positive messages, guiding children towards positive behaviours. This entertaining approach subtly influences children, making them willing to try eating vegetables, which is very important for their health and overall development.

The findings indicate that this project can use cartoon character designs to appeal to children aged 7-10, helping them connect with the characters as if they were friends. During this process, children learn about nutrition and healthy eating habits through play, subtly absorbing the knowledge. Based on these findings, the project is directed towards several key areas: cartoon character design, interaction between characters and children, gamified learning, and situational teaching. These methods effectively integrate nutritional education into children's daily entertainment, allowing them to learn and master healthy knowledge in a relaxed and enjoyable environment.

## **2.3 Ways to Directly Influence Children's Active Consumption**

Research has shown that fruits and vegetables have health benefits and can reduce the risk of many diseases. To improve children's eating habits, novel and effective ways to make fruits and vegetables more appealing need to be explored to increase their intake. Increasing children's interest in fruits and vegetables through food promotion is important to improve their healthy eating habits. While many strategies make fruits and vegetables desirable to children, such as parental communication strategies and feeding practices, this project will focus on the role of food promotion.

A European study showed that only 8.8% of children consumed the recommended five servings of fruits and vegetables per day, while the majority consumed excessive amounts of high-fat, high-sugar, high-salt (HFSS) foods (Frans et al. 6). Many HFSS food brands (e.g., Coca-Cola, McDonalds) maintain social media accounts and encourage users to interact with branded content through contests, coupons, monetary discounts, and interactive tools (Frans et al. 3), as well as cartoons like

Ronald McDonald. These brands' interactive tools have a direct effect on product consumption.

Children's attitudes towards fruits and vegetables can lead to the rejection of the message, so marketing needs to take a "fun" approach to consuming these foods, rather than an "educational" approach about their benefits (Marty et al 1). Different marketing strategies can be effective in promoting fruit and vegetable consumption, including using various marketing techniques such as supermarket promotions, television advertisements, digital media marketing, celebrity endorsements, outdoor marketing, and school reward programs (Frans et al. 7). By creating a fun environment for consumption, rather than just educating children about the health benefits of these foods, children can be more effectively enticed to actively choose fruits and vegetables.

With reference to the "Free Fruit for Kids" program launched by Tesco, the UK's largest retailer chain, which aims to encourage children to eat healthily, Tesco has set up a special section in the fruit section of its supermarkets for children to take fresh fruit. This not only helps to reduce fruit waste but also provides children with healthy options. The program has been successfully rolled out and implemented in over 800 Tesco stores, helping children develop healthy eating habits and maintain them as they grow up (Tesco) . This shows that supermarket partnerships have a direct impact on children's healthy behaviours.

## **2.4 Traditional Chinese knowledge**

In China, the maintenance of health prioritises diet above all else, a tradition dating back to ancient times (Xu 135). A common traditional Chinese proverb states, "Food is the most important thing for the people," illustrating the paramount significance of food in Chinese culture (Zhang 102). Central to Chinese food culture is the fundamental concept of the unity of heaven, earth, and humanity. This principle underscores the interconnectedness and harmony between humans and the natural world, particularly in dietary practices (Xu 120). Traditional Chinese dietary principles

emphasise adherence to natural rhythms and reverence for nature, with a focus on nurturing the body. Eating is deeply embedded in all aspects of Chinese culture, extending beyond mere sustenance. Greetings often begin with inquiries about whether one has eaten, illustrating the cultural importance of food in social interactions. Phrases such as "eating bitter" to describe hardship and "eating heavy" to denote anxiety further demonstrate the cultural significance of food-related expressions (Zhang 102).

Traditional Chinese food culture is a culmination of millennia of wisdom, reflecting profound philosophical concepts, notably those found in Traditional Chinese Medicine (TCM) theories. The principle of "medicine and food are from the same source" seamlessly integrates diet and medicine to address both hunger and health needs (Zhao 243). The Chinese diet is informed by TCM principles such as Yin-Yang theory and the Five Elements (Cui 425). The concept of the Five Elements emerged from ancient Chinese attempts to understand the world and its natural laws. It encompasses the laws governing astronomy, matter, seasons, weather, space, and the human body. In the realm of matter, the Five Elements represent the foundational elements of wood, fire, earth, metal, and water. In the context of the human body, they correspond to the harmonious flow of qi within the liver, heart, spleen, lungs, and kidneys. Furthermore, the concept extends to the orderly progression of the five seasons: spring, summer, long summer, autumn, and winter. This holistic perspective reflects ancient insights into the interconnectedness and characteristics of the natural world, forming an integral aspect of Chinese philosophical thought. Early Chinese scholars recognized the close correspondence between the Five Elements and the five human organs: wood corresponds to the liver; fire to the heart; earth to the spleen; metal to the lungs; and water to the kidneys (Xu 4).

Historically, ancient China was an agricultural civilization. People in ancient times did not have advanced irrigation systems and relied entirely on the changes and laws of nature for production and life. If there was no rain, agricultural civilization could not develop. Therefore, it cannot be said that humans rule over nature or conquer nature, but rather adapt to nature and even beseech nature. This is the reason why ancient China had rituals for praying for rain and revering the heavens. People's reverence for

nature has continued for thousands of years, and the famous Temple of Heaven is a symbol of this reverence. Therefore, people have had a keen observation and understanding of the natural world, as well as profound respect and awe for it (Dongyue 1).

Ancient Chinese philosophers and thinkers, such as Laozi, Zhuangzi, Confucius, and Mencius to Dong Zhongshu, Zhu Xi, and others. put forward theories and methods for harmonious coexistence between humans and nature, such as "harmony between heaven and humanity," "yin and yang," and "the Dao follows nature." These ideas reflect the correlational thinking and cosmology of ancient China. The concept of "harmony between heaven and humanity" is a typical ideological form of agricultural civilization. In the face of the ecological problems we currently face, exploring and interpreting the ecological wisdom embedded in "harmony between heaven and humanity" is of great conceptual and practical significance in addressing contemporary issues (Xiaorong 2014). The concept comes from ancient Chinese philosophy "Harmony between heaven and humanity" is a typical Eastern thought that embodies the correlative cosmology.

The concept of "harmony between heaven and humanity" is a philosophical belief that regards humans and nature as an organic whole. It advocates for people to follow the laws of nature, coexist harmoniously with nature, and achieve a state of oneness between the self and the universe. The idea is neither anthropocentric nor naturalist. It is a way of thinking that views humans and the natural world as interconnected entities, where humans are a part of nature and nature is a part of humans. "Harmony between heaven and humanity" is an ecological philosophy that emphasises the interdependence, mutual influence, and coordination between humans and nature, rather than control, conquest, and exploitation (Hu). It advocates for humans to comply with the laws of nature, rather than defy them, and promotes respect for the value of nature, rather than neglecting it.

In Chinese history, the concept of "harmony between heaven and humanity" has been widely applied in various fields such as politics, economy, culture, education, medicine, and art. In terms of the economy, the concept proposes the principles of

"frugality," "moderation," and "the doctrine of the mean," which require people to restrain desires, adapt to needs, and avoid waste and excessive exploitation. In the field of medicine, the concept is related to theories such as "yin and yang," "five elements," and "qi and blood," which emphasise the balance and coordination between the human body and the natural environment. In the realm of food and diet, "harmony between heaven and humanity" advocates for three principles: natural eating, moderate eating, and balanced eating (Xu and Chen 169) . It calls for people to follow the principles of nature, refrain from excessive interference and alteration of food's essence, respect the original flavours and nutrition of food; eat moderately, avoiding greed and overconsumption, to maintain physical health and ecological balance; and select appropriate foods and cooking methods based on the seasonal climate, personal preferences, and the functioning of the five viscera, to harmonise the energies of the internal organs. In various aspects of Chinese lifestyles, one can observe people's compliance with and reverence for nature, reflecting the concept of "harmony between heaven and humanity (Xu and Chen 169)."

## **2.5 The twenty-four solar terms**

The characteristics associated with the 24 Solar Terms illustrate the interconnectedness of all life with the seasonal cycle, embodying the concept of the unity of heaven and humanity, and influencing the functioning of the body's organs. Choosing foods that align with seasonal changes and individual constitution is crucial for maintaining balance and health. For instance, spring corresponds to the wood element and the liver. During spring, liver-related disorders may become more pronounced, and liver function may fluctuate, leading to increased symptoms of fatigue. Therefore, during this season, the focus is on regulating liver qi and promoting smooth liver function. Dietary choices should aim to nourish the liver and promote the circulation of qi and blood. (Yu 2)

| 季节<br>Seasons     | 五行<br>Five Element | 五脏<br>Five Organs | 食用属性<br>recommended taste |
|-------------------|--------------------|-------------------|---------------------------|
| 春<br>Spring       | 木<br>Wood          | 肝<br>Liver        | 甘(甜)<br>Sweet             |
| 夏<br>Summer       | 火<br>Fire          | 心<br>Heart        | 酸<br>Sour                 |
| 长夏<br>Long Summer | 土<br>Earth         | 脾<br>Spleen       | 咸<br>Salty                |
| 秋<br>Autumn       | 金<br>Metal         | 木<br>Lung         | 苦<br>Bitter               |
| 冬<br>Winter       | 水<br>Water         | 木<br>Kidney       | 辛<br>Spicy                |

Fig.2. The relationship between seasons, the Five Elements, the Five Organs, the Five Directions, and the application of medicines, work by author, based on 中医肝病专家提醒:春季养肝正当时 [Traditional Chinese Medicine Experts Remind: Spring is the Right Time to Nourish the Liver]. work by author.

In former times people, through long-term agricultural production and observation of the laws of celestial movements and climate changes, created the practice of the twenty-four solar terms. The twenty-four solar terms reflect the changing patterns of the natural world and also guide agricultural production and daily life. It divides the sun's position along the ecliptic into twenty-four specific segments, with each solar term representing approximately two weeks. The twenty-four solar terms, represented in Fig 3 , are an important part of the traditional Chinese calendar and a creative invention.

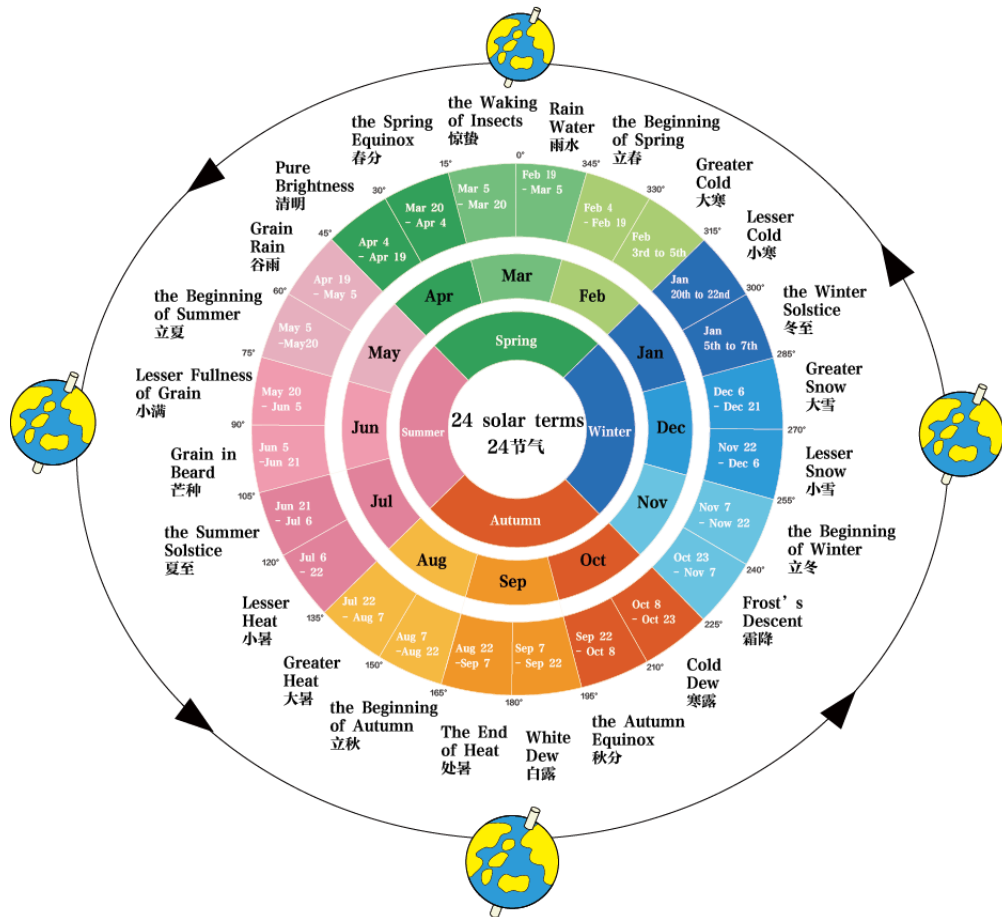


Fig.3. The twenty-four solar terms, work by author, based on 二十四节气表 - 可以查询 2024~2025年每个节气具体到来时间和结束时间 [ 24 Solar Terms Table - You can query the specific start and end times of each solar term from 2024 to 2025 ]. work by author.

Each solar term has its unique meaning and customs, reflecting the concept of harmonious coexistence between humans and nature. "Li Chun" marks the renewal of everything and is the first solar term after the Spring Festival in the traditional Chinese calendar. "Qing Ming" is an important period for ancestral worship and the start of spring ploughing. "Duan Wu" is a traditional festival commemorating the patriotic poet Qu Yuan and is considered a time to ward off evil spirits and epidemics. The twenty-four solar terms embody the ecological philosophy of harmony between heaven and humanity, reflecting people's observations of natural cycles and sensitivity to seasonal changes. China is one of the first countries in the world establishing farming and agriculture. Agricultural production requires accurate farming seasons,

so people carefully observe the sky. In the Western Zhou Dynasty, astronomers used gnomons and tables to measure the shadow of the sun, determine the winter solstice, summer solstice and solar terms of the year, and guide agricultural and animal farming (The Paper). With the introduction of the calendar, the 24 solar terms have become an important part of the lunar calendar .

Additionally, each solar term is closely related to food. For example, during the solar term of "Li Chun" (Beginning of Spring), people consume symbolic foods representing new life such as spring pancakes, spring rolls, and Chinese toon. During the solar term of "Qing Ming" (Pure Brightness), people enjoy refreshing foods symbolising the clarity of the season, such as green rice balls, tender tea, and mugwort. During the solar term of "Duan Wu" (Dragon Boat Festival), people indulge in proper foods like rice dumplings and fresh lychees. And during the solar term of "Zhong Qiu" (Mid-Autumn Festival), people savour foods symbolising reunion and completeness, such as mooncakes, pomelos, and osmanthus (Baidu).

The practice of health preservation based on the solar terms involves adjusting one's body and mind through appropriate diet, daily routines, and physical exercise, according to the seasonal changes and physiological characteristics of each solar term. The methods of health preservation differ for each solar term. In spring, health preservation involves aligning with the characteristics of the rising yang energy, focusing on dispelling dampness, regulating the liver, and protecting yang energy. It is advisable to consume warm, bitter, and light foods while avoiding spicy, greasy, and overly sweet foods. In summer, health preservation aligns with the outward expansion of yang energy. It emphasises heat relief, dampness removal, detoxification, and thirst quenching (Zhihu). It is recommended to consume cooling, sweet, and nourishing foods while minimising warm, spicy, and dry foods. In autumn, health preservation aligns with the declining yang energy and the lengthening of yin energy. It focuses on nourishing yin, moisturising dryness, clearing the lungs, and strengthening the body. It is beneficial to consume sour, nourishing, and heat-clearing foods and to reduce spicy, hot, and dry foods. In winter, health preservation aligns with the prevalence of yin energy and the decline of yang energy. It emphasises preservation, invigorating yang energy, nourishing the body, and sealing and preserving vital energy. It is

recommended to consume warm and sweet foods while minimising cold, bitter, and light foods (Zhihu).

The influence of the 24 solar terms has been passed down from the agricultural era to the present day, and the terms themselves have undergone changes and revisions. The results obtained 3,000 years ago based on observations and records of physical phenomena may not be exactly the same as those of today, but the 24 solar terms have been constantly revised and improved through generations. According to current research, it can be summarised that astronomical changes have been minimal, while some changes have occurred in physical and natural phenomena (Zhang). However, these changes are relatively stable and only require a certain degree of adjustment. As a result, the 24 solar terms are still relatively accurate today, which is an important reason why they have been used and passed down for so long. Although we are not as dependent on agriculture as we were in the past, agriculture is still affected by natural changes (Zhang). From this perspective, the 24 solar terms will still be around for the future and continued to be used. Therefore, the project incorporates the 24 solar terms and encourages people to consume seasonal fruits and vegetables according to the rhythm of the season. This can help people adapt to natural rhythms, stay healthy, and promote Chinese culture. Combining modern lifestyle and traditional wisdom, the project will provide healthier and more natural dietary choices.

## **2.6 Environmental issues and the value of cultural knowledge**

Although anti-seasonal fruits and vegetables allow people to enjoy their favourite produce whenever they want, their taste and nutritional value can be reduced. Often, out-of-season produce utilises greenhouse and refrigeration techniques to extend the growing period or freshness, resulting in less sugar, vitamins, minerals, and other nutrients, and a less flavorful taste than seasonal produce (Ben). Anti-seasonal produce often requires more pesticides to control pests and diseases, and greenhouse or refrigeration conditions are not conducive to pesticide degradation, increasing pesticide residues in fruits and vegetables, which may pose a threat to

human health. For example, a study in Bangladesh found a 56% increase in pesticide use for the production of anti-seasonal vegetables (Pepijn et al. 132). In addition, the production and transportation of anti-seasonal produce requires more energy, water, and land, leading to increased emissions, wastewater, and waste, burdening and polluting the environment (Rahmah et al. 2). These impacts oppose the 12th principle of the United Nations Sustainable Development Goals (SDGs), which is to adopt sustainable consumption and production patterns. However, in ancient times, people had great respect for nature and lived in harmony with it. Can we, therefore, bring this respect for nature into the modern world? By going back in history and rethinking the relationship between humans and nature, we can lead people to choose sustainable lifestyles.

This project aims to review and investigate the historical influence of ethnic knowledge on dietary habits, as well as the influence of ancient culinary culture on the ancients (Liu). For instance, concepts of ecological balance and the unity of humans and nature hold significant importance in Chinese traditional culture, emphasising the symbiotic relationship between humans and nature. Sustainable dietary concepts play an important role, involving the selection of plant-based foods, saving grains, adapting to seasonal availability, and choosing the freshest, most delicious, and most nutritious fruits and vegetables to support local agriculture and economic development, while reducing carbon emissions and pollution in the transportation process (Liu). Minimising negative impacts on the environment reflects a balanced and harmonious relationship between humans and the natural ecosystem, benefiting both humans and nature.

This study aims to explore how the concept of unity between humans and nature, observed through the observation of the twenty-four solar terms and the selection of seasonal fruits and vegetables, can benefit contemporary living. By utilising the twenty-four solar terms as a knowledge system of time and selecting the most suitable fruits and vegetables based on their seasonal availability, the goal is to achieve alignment with natural laws and maintain physical well-being. Through in-depth research into ethnic knowledge and traditional culinary culture, we can draw

design inspiration from ancient wisdom to provide feasible solutions for sustainable diets in modern society and propel us towards a more sustainable future.

## 2.7 Design Precedents

The project analysed the strengths and weaknesses of Bear Snacks, the Pokémon Card Game, and the Advent calendar and drew inspiration from them to optimise the 24 Seasons Fruit and Vegetable Card Project. The program aims to help children actively consume fruits and vegetables and learn about the 24 solar terms through card collection and task completion.

### 2.7.1 BEAR Snacks

BEAR Snacks is a company dedicated to providing natural, delicious, and fun fruit snacks. In addition, BEAR Snacks offers a fun interaction with its Fruit Rolls: each Fruit Roll package comes with a collectible card. These cards showcase amazing animals from the animal kingdom. Kids can collect these cards and explore the incredible variety of 60 different wild animals on the planet. BEAR Snacks' card-collecting mechanism shows its strengths and offers inspiration for the project.

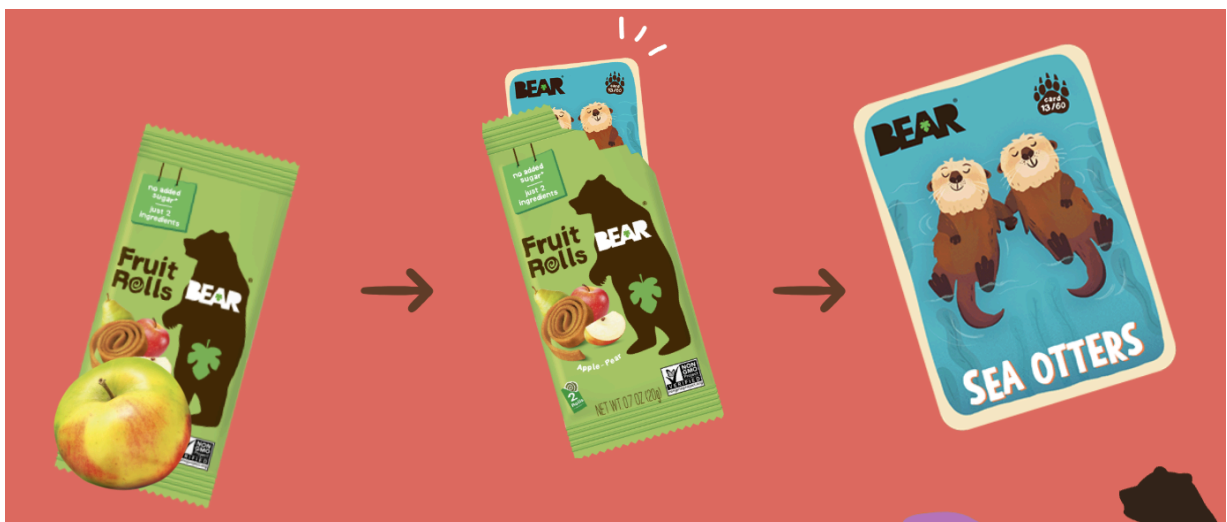


Fig. 4. Promotional image from Bear Snacks. Bear Snacks, [bearsnacks.com/en-us/home](https://bearsnacks.com/en-us/home).

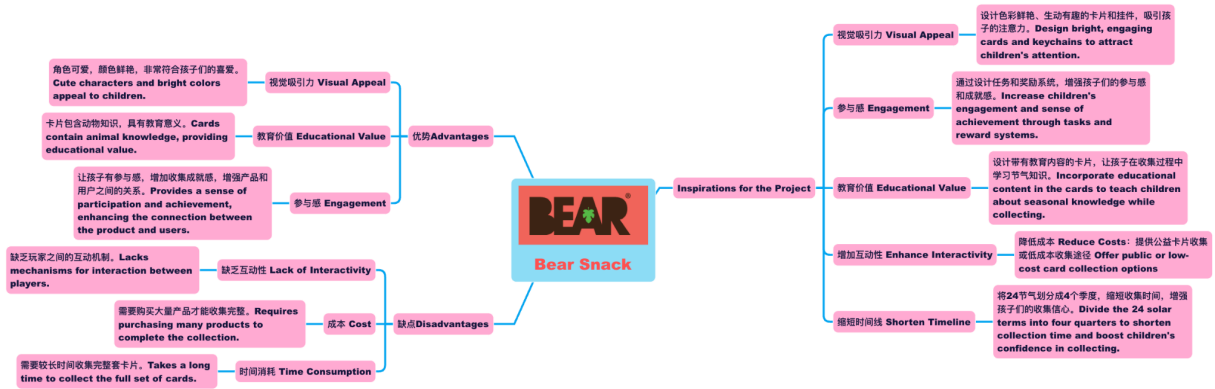


Fig. 5. Analysis of Bear Snacks' Advantages and Disadvantages. work by author.

First, the character design is cute and simple, with bright and vivid hues, which is very suitable for children. Studies have shown that bright hues attract children's eyes because they help them distinguish objects within their field of vision. Children spend more time looking at bright hues than at pastel shades or soft tones (Pancare). The design style aligns with children's preferences and fuels their desire to collect. Secondly, Bear Snacks' card-collecting activities provide a sense of engagement, and children get a sense of accomplishment by collecting cards. The sense of participation helps connect the program's activities with the users (7-10 years old) and keeps them interested, helping to reach the program's goal. Finally, the cards contain animal knowledge, which is educational and helps children learn through entertainment. Research has shown that children can become addicted to cartoons and cartoon character merchandise, so educators and parents can incentivize children to use these merchandise for educational purposes, as part of imaginative play, or to create animated videos (Robert and George 19). Cartoon characters can be incorporated into educational practices through the creation of storytelling, and other activities to enhance children's interest and engagement in learning (Robert and George 19).

However, there are some drawbacks to Cub Snacks' card-collecting campaign. First, there is a lack of interactive mechanisms between players, which may limit the game's social appeal. Second, completing a full set of cards requires the purchase of many products, which may increase the cost and financial burden on users. Finally, it takes a

long time to collect a full set of cards, which may lead to frustration and affect children's continued interest and engagement. These shortcomings highlight the need for more interactive elements, cost-effective collection options, and ways to reduce the time required to complete a collection.

### **2.7.2 The Pokémon Trading Card Game (PTCG)**

The Pokémon Trading Card Game (PTCG) is a swappable card game with cards measuring 63x88 mm (2.5x3.5 inches) based on the Pokémon series. In 2017, PTCG reached a market share of 82% in the European battle card game market. As of January 2023, the game has sold over 63.2 billion cards worldwide (pokemon). However, it also has some challenges. The purpose of this section is to outline the main advantages and disadvantages of the Pokémon Card Game based on a detailed attribute chart.



*Fig. 6. Children interacting with Pokémon trading cards. Source: Pokémon Trading Card Game Parents Guide, The Pokémon Company, <https://tcg.pokemon.com/en-us/parents-guide/>*

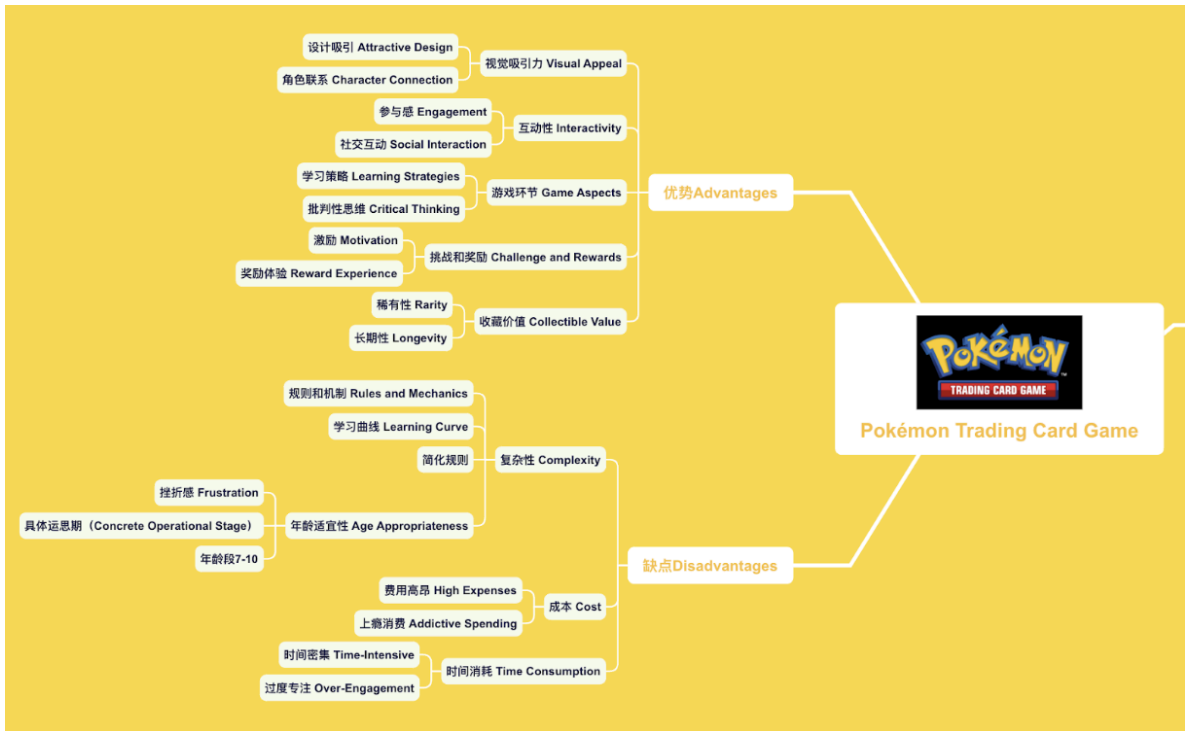


Fig. 7. The Pokémon Trading Card Game (PTCG) ' Advantages and Disadvantages. work by author.

First of all, one of the main advantages of the Pokémon Card Game is its attractive design and visuals. The cards are beautifully designed and colourful to attract the player's attention. This visual appeal complements players' emotional connection to the Pokémon characters and enhances their engagement with the game. Second, the game makes players more engaged through its interactivity and sense of participation. Players interact with the game, which enhances their engagement and gaming experience.

In addition, the beautiful design of the cards gives them collector's value, which not only maintains players' interest but also increases the game's long-lasting appeal. The challenge and reward mechanism not only boosts players' motivation but also enhances the overall experience of the game. Finally, the rules and mechanics of the Pokémon Card Game find a balance between simplicity and complexity. This balance ensures that the game is easy to understand for beginners, while also providing depth and challenge for experienced players. The clear rules help maintain a structured and engaging gaming experience.

Despite these strengths, the Pokémon Card Game has some drawbacks. First, the issue of its age appropriateness is a major drawback. Although the game is designed to be appropriate for children aged 7-10, its complexity can be confusing for this age group, leading to frustration and potentially reducing their enjoyment of the game. Second, the issue of high cost is also a significant drawback. Purchasing new card packs may lead players to develop addictive spending behaviours in order to improve their decks or complete their collections. Finally, the Pokémon Card Game is time-consuming. Players must invest a significant amount of time to improve their skills and build collections, which can lead to over-engagement. This focused attention on the game may interfere with other important activities and responsibilities, leading to an unhealthy balance.

In summary, the Pokémon Card Game offers a range of benefits, including its appealing design, engagement and interactivity, promotion of critical thinking and learning strategies, and motivating challenge and reward system. However, it also has significant drawbacks, such as age-appropriateness issues, high complexity, high cost, and high time consumption and excessive concentration. Balancing these factors is crucial to ensure that players can enjoy the game while minimising its potential drawbacks. Overall, the Pokémon Card Game remains a beloved and engaging game that continues to appeal to players across the globe.

## Chapter 3. Method and Design Process

### 3.1 Method

This research method employs secondary research and practice-based iterative visual communication design. My design research integrates sustainable development and seasonal vegetable consumption into children's daily lives through the use of collectable incentive cards and display possibilities in collaboration with Chinese supermarkets. This design research project not only concerns the individual physical health of children but also represents an innovative attempt to reshape societal dietary structures and preserve traditional culture. This project uses the framework of the twenty-four solar terms, dividing the year into four stages, each containing six solar terms. During each solar term, children will be encouraged to taste the corresponding seasonal vegetables, while being motivated by card rewards provided by supermarkets to develop a keen interest in healthy eating.

The project aims to allow children to experience the deliciousness of seasonal foods in a joyful atmosphere through practical activities, while conveying the concept of sustainable development to help them establish healthier and more culturally enriched lifestyles. In this era, we have a responsibility to cultivate the next generation's love for traditional culture and sustainable living, making them responsible citizens.

The following section discusses the implementation process of the project, the achievements made, and provides prospects for future development.

The potential collectable card game collaboration between food education and supermarkets encourages children to consume more seasonal vegetables corresponding to the 24 solar terms, aligning seasonal vegetables with the traditional cultural significance of the 24 solar terms in China.

This approach helps promote healthy growth in children. By consuming more seasonal vegetables, children obtain greater nutrition, enhance their immunity, and reduce the risk of illness, thereby promoting healthy growth. Additionally, children can

learn about the traditional cultural significance of the 24 solar terms in China, recognizing the meanings and characteristics of different solar terms, thereby strengthening their sense of identification and pride in Chinese traditional culture.

Furthermore, this collectible card game also helps cultivate environmental awareness in children. By selecting seasonal vegetables, children support the production and sale of local agricultural products, promote rural economic development, and reduce food transportation distances, thereby reducing carbon emissions and contributing to environmental protection.

In addition to the above aspects, this mechanism also aims to foster good dietary habits in children. By actively participating in activities to consume seasonal vegetables, children develop good dietary habits and enhance their awareness and understanding of healthy eating.

Finally, this collectible card game also enhances children's interest in learning. By helping children understand the traditional cultural significance of the 24 solar terms and their connection with seasonal vegetables, it stimulates their enthusiasm for exploring and learning about Chinese traditional culture and natural knowledge.

## **3.2 Design Process**

### **3.2.1 Initial Design Concept**

My initial design idea was to target vegetarians and consider how to facilitate their diet. This idea came from my own background as a vegetarian, and I was aware of the health and environmental benefits of a vegetarian diet. However, during the thought process (Figures), I realised that while a vegan diet has many benefits, a program that only targets vegans may limit its impact. Therefore, I began to think about how to expand the target population to benefit more people than just vegetarians. Thus, the goal of the project shifted to promoting healthy eating for the majority of the population.

## **Expanding the Target Population**

In the process of expanding the target population, I encountered some problems. During interviews with meat consumers (Figure), I realised that although many people knew that a vegetarian diet was healthy, it did not change their eating habits. If the benefits of vegetarianism were only emphasised, many meat eaters, even if they recognised it in their hearts, would still continue to eat meat afterward, and thus the project would not be able to achieve its goal. Therefore, the challenge was to get meat eaters to voluntarily go for more fruits and vegetables through the program instead of being forced to change their eating habits. This was a big challenge due to its difficulty changing established dietary preferences. Therefore, I expanded the goal of the program from targeting only vegetarians to include meat eaters, and shifted it to encourage all people to eat more veggies instead of completely changing their eating habits. This shift helped the program become more feasible and acceptable.

## **Understanding the Habits of Meat Eaters**

During this shift, the program encountered a major challenge. Many participants had difficulty changing their eating habits even after learning about the benefits of a vegetarian diet. This forced me to rethink the direction and strategy of the program. During initial informal interviews, some participants felt coerced and would think, "I know vegetarianism is good, but don't force me to go vegetarian." This was a big challenge. Therefore, the goal of the project is not to force people to change their eating habits but to encourage them to voluntarily and actively choose to eat more vegetarian food. This volunteering and initiative will be a big challenge.

In the process, I realised some of my own problems, namely that I had not sufficiently considered the ideas of meat eaters. Not everyone is receptive to the idea of vegetarianism. Therefore, I started to explore from the perspective of meat eaters how to make them voluntarily accept and actively eat more fruits and vegetables. This process was not only an adjustment of the program strategy but also a deepening of my own understanding and acceptance of the users.

## **Rethinking the Strategy**

To find a breakthrough, I decided to explore Chinese food culture in depth, hoping to get inspiration from it to solve the problem. By studying Chinese eating habits through the ages, I discovered the concepts of “the unity of man and heaven” and the 24 solar terms, which emphasise the harmony between man and nature as well as the wisdom of seasonal eating. These cultural elements not only fit in with the concept of healthy eating but also provide a deeper educational framework for the program.

By incorporating these traditional cultural elements into the project, I realised that people could be educated not only about diet but also learn valuable cultural knowledge. For example, by introducing the dietary practices of the 24 solar terms, people can understand why choosing different ingredients during different seasons is beneficial to their health. This not only allows people to better accept the concept of healthy eating but also allows them to understand the cultural heritage and wisdom involved. This approach to cultural education not only avoids the feeling of compulsion but also increases the appeal and educational value of the program.

### **Incorporating Traditional Culture**

To find the most suitable target group, I conducted further thinking and market research. By analysing market data and relevant research, I found that children are a key group because they are the most receptive to new ideas and habits. By educating children, we can directly influence their eating habits and indirectly influence their families and communities, thus achieving wider promotion of healthy eating. I believe that it is not enough to just talk about the benefits of fruits and vegetables, but there is a need for a cultural approach to make these concepts better accepted. With the heritage of Chinese culture, the project can spread the concept of healthy eating more effectively. Therefore, I identified the target group of the project as children (Children’s Bureau Blog).

### **Identifying the Target Group**

By combining traditional culture and modern health concepts, I found a new direction for the project. This new cultural context reinvigorated the project, making it not only a dietary education program but also a platform for cultural dissemination and health

promotion. Ultimately, this shift not only overcame the initial project's challenge but also laid a solid foundation for further design research..

### **Combination of Culture and Health**

Early in the design process, the author considered the use of mascots to attract children's attention. By researching the types of mascots that children like, the author found that both the Olympic mascot and Popeye's design were very successful. In particular, the image of Popeye becoming strong after eating spinach had a huge impact on spinach sales at the time and was highly influential. This inspired the author to think about how to visually demonstrate the benefits of healthy eating through the change of characters, as 7-10-year-olds are more likely to accept images than words. Therefore, visually striking light block cards were utilised to show the changes between characters and visually demonstrate the positive effects of healthy eating (Children's Bureau Blog).

### **Using Mascots to Engage Children**

For the selection of characters, the authors chose the Sichuan Golden Monkey. This animal is an endangered species in China, and China is strongly advocating endangered animal protection and sustainable development. By choosing the Sichuan Snub-nosed Monkey as the mascot, the author hoped to lead children to think about the seriousness of animal endangerment and the importance of environmental sustainability. The Sichuan snub-nosed monkey not only symbolises the concept of sustainable development but also enhances the emotional connection between children and the character through its unique image and story background. Through vivid character design, the image of the Sichuan snub-nosed monkey can not only raise children's awareness of healthy eating but also inspire their love and participation.

### **Mascot Selection**

To achieve this, the author designed a character related to the Sichuan Golden Monkey to make it a playmate for children. Through various activities and experiences with the Sichuan Snub-nosed Monkey, children gradually build up an attachment to the character. Children can explore different seasonal fruits and vegetables with the

monkeys and learn the benefits of different fruits and vegetables. This interactive design not only educates children about seasonal fruits and vegetables but also allows them to develop a deep emotional connection through their interactions with the Sichuan snub-nosed monkeys.

### **3.2.2 Game Design and Interaction**

#### **Interactive Activity Design**

During the design process, the author reflected on the significance of the character for children and realised that just being a toy could not fully achieve the educational purpose. Therefore, the author decided to give the character more educational connotations, so that it is not only a tool for entertainment but also a vehicle for education. In order to make children participate actively, the author considered the reward mechanism. Through the design of parent-child interaction, the ideas of Monopoly-like games and refrigerator stickers were proposed early on. These designs not only enhance parent-child interaction but also allow children to learn in a relaxing and enjoyable atmosphere through games. However, the author later realised that the Monopoly design was more oriented to entertainment and might eventually deviate from the educational purpose of the project. Thus, the author further explored how to skillfully combine parent-child entertainment and education, so that children can accept these concepts in a relaxing and enjoyable environment, which is another new challenge.

#### **Parent-Child Interaction Design**

In the process, there were setbacks encountered. For example, the early designs, although popular with the children, were too entertaining to achieve the desired educational effect. In order to overcome these challenges, the author continuously adjusted their design strategies and explored more ways that were both entertaining and educational. After repeated attempts and tests, the author considered that by combining the traditional culture of the twenty-four solar terms and modern health concepts, the children's interest could be attracted more effectively. By eating more

fruits and vegetables, chronic diseases and obesity conditions can be reduced, and the combination of this health concept with traditional culture makes the program more attractive.

### **Cultural Education Strategies**

In this process, the author carried out a preliminary card design with the aim of allowing children to obtain cards after eating vegetables and fruits through a reward mechanism. Each card not only contained reward information but also incorporated the 24 solar terms and related cultural knowledge, combining education with entertainment. However, as the project progressed, the author realised that a simple reward mechanism might not be sufficient to sustain children's interest for long and could not sustain parent-child interaction. This is because simple reward mechanisms tend to make children bored, resulting in the need for parents to constantly look for new ways to stimulate their children's interest, thus increasing the burden on parents. Therefore, the author needed to consider designing a more comprehensive series of activities aimed at promoting parent-child interaction so that parents can easily spend time with their children and children can be more engaged and enjoy the process. Such a series of activities could include more interactive elements and even modest competitions to keep children interested and motivated. This requires thinking about the mechanics of a series of activities so that they can be ongoing and kept fresh.

### **Initial Card Design**

On critically analysing the design there was too much text on the back of the cards, which could be difficult for children to understand. So the author redesigned the back, using interesting icons to tell the story and pictures instead of words to make the content more accessible and understandable to children. As the design of the cards was gradually improved, the author began to consider how to disseminate the cards more widely so that more families could be exposed to the educational content.

### **Design Optimization of the Cards**

In the process of exploration, the author discovered Bear Snacks' card-collecting supermarket snack activity, an activity that could attract more people to participate. So, the author decided to try to cooperate with supermarkets to expand the

dissemination. By cooperating with supermarkets, more families can be exposed to these cards in their daily shopping, thus expanding the impact of the program.

### **Collaboration with Supermarkets**

At the same time, the author also considered the profound impact of sustainable diets on society and hoped to further expand the reach and impact of the project through cooperation with the government, supermarkets, and families. To this end, the author set out to find some successful examples of collaboration with supermarkets to draw on and apply to the project. The “Free Fruit for Kids” program initiated by the Tesco chain in the UK is a very good precedent. The program encourages children to choose healthy food when shopping by providing free fruit in the store. This model has not only been successful in promoting healthy eating habits among children but has also increased customer satisfaction and loyalty to the supermarket.

By learning from Tesco's success, the author hopes to promote card collection activities in supermarkets to make families more aware of healthy eating and seasonal fruit and vegetable choices in their daily shopping. Such a partnership would allow the program to have a positive impact on the wider community and promote healthy eating habits by engaging children's interest through a combination of education and entertainment.

### **Promoting Card Collection Activities**

This design process demonstrates the transformation from the initial idea to the final product, and through continuous reflection and improvement, the project becomes more refined and meaningful. By progressively adding interactive and educational content, as well as optimising the dissemination method, the project was able to not only engage children's interest but also create a positive impact in the wider community.

### **Summarising and Reflecting**

During the design process of the project, the author went through a number of reflections and improvements. The initial design was only for vegetarians, but with in-depth research on the market and the target group, the author gradually realised the

need to broaden the target group to cover meat eaters and to encourage everyone to increase their fruit and vegetable intake. This shift made the project more inclusive and feasible.

The author further explored the integration of traditional culture with modern health concepts and found that by incorporating the 24 solar terms and traditional Chinese dietary habits, the program could be made more culturally in-depth and educationally valuable. This strategy not only increased the attractiveness of the program but also effectively avoided forced changes in dietary habits by educating people to voluntarily choose a healthier diet through culture and knowledge.

During the implementation of the program, the author focused on the design of parent-child interactions and enhanced the motivation of family participation by designing interesting cards and interactive activities. Through test feedback, the author continued to optimise the card design to make the content more accessible and understandable to children, ensuring a combination of education and entertainment.

In addition, the author drew on the successful experience of cooperation with supermarkets to expand the dissemination and influence of the program through cooperation with supermarkets. Such cooperation not only promoted the formation of healthy eating habits but also provided strong support for the promotion of the project.

Overall, this project has gone through many adjustments and improvements from its initial conception to its final implementation, and each reflection and optimization has made the project better and more meaningful. By combining traditional culture and modern health concepts, designing interactive parent-child activities, and cooperating with supermarkets to promote the program, the project has successfully attracted the participation of children and families and promoted the development of healthy eating habits.

## **3.3 Overall Project Outcome**

### **3.3.1 Four Seasons Tree Design**

#### **3.3.1.1 Concept and Function of the Four Seasons Tree**

The Four Seasons Tree is an interactive tool for storing the 24 solar terms cards, aiming to give children a more intuitive understanding of the 24 solar terms in China through collection and games. After collecting the corresponding cards, children can hang them on the Four Seasons Tree as a display and storage device. The Four Seasons Tree is designed to be divided into four sections: spring, summer, fall, and winter, with six solar terms for each season. There are 24 positioning numbers on the Four Seasons Tree, each corresponding to a festival season, for hanging the corresponding festival cards. The Four Seasons Tree is not only an educational tool but also an entertaining device that is visually appealing and can be prominently displayed at home or in the supermarket.

For educational functions, the Four Seasons Tree can deepen children's understanding of the 24 solar terms and help them learn about the 24 solar terms and traditional culture. The interactive function enhances children's participation and sense of achievement by completing tasks and collecting cards. Regarding its decorative function, the Four Seasons Tree serves as an aesthetic ornament that can add cultural atmosphere to homes and public places.



Fig. 8. Four Seasons Tree design showing the division of spring, summer, autumn, and winter. work by author.

### 3.3.1.2 Bookmark Slot Design

To better organise and display the 24 solar terms cards, bookmark slots were added during the design process. These slots not only store the festival cards but also introduce the traditional cultural knowledge of each festival and the benefits of corresponding fruits and vegetables to children in advance. The bookmark slots are attached directly to the 24 fixed positioning points on the tree, making them easily accessible and viewable by the children during the interactive process. Each bookmark slot is designed with a small experiential activity for each festival, allowing

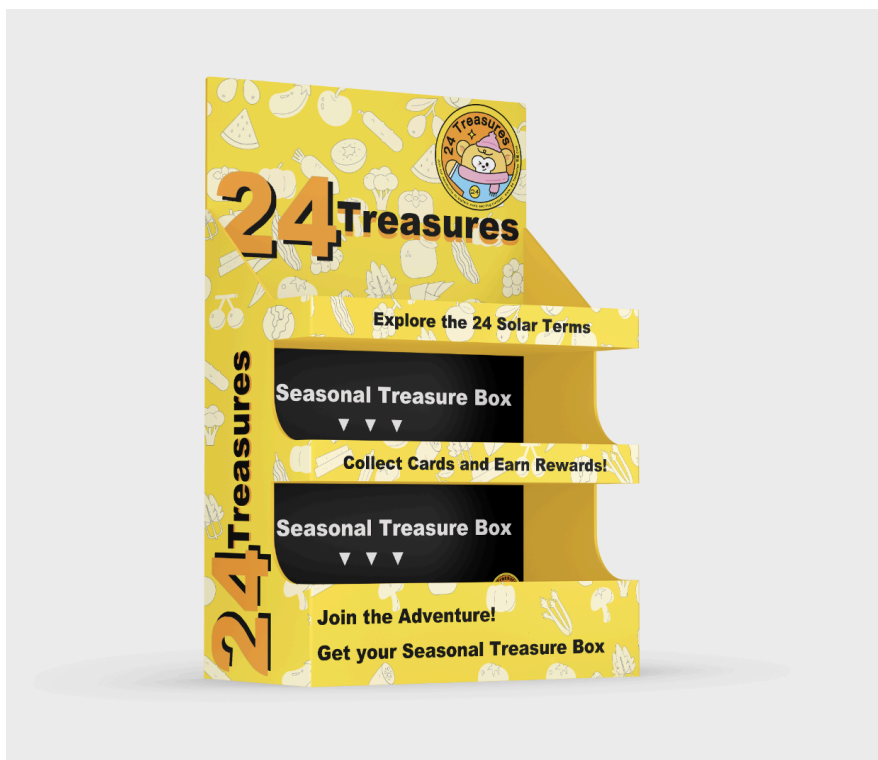
children to further understand the traditions and significance of each festival through participation.



Fig. 9. Bookmark slot design for the Four Seasons Tree. Each slot corresponds to a specific solar term, featuring a small experience related to that term. work by author.

### 3.3.2 Supermarket Cooperation to Receive the Four Seasons Tree

To promote the Four Seasons Tree program, the project partnered with supermarkets. Specific steps include purchasing a gift pack of fruits and vegetables from a designated shopping shelf in the supermarket (Figures 10 and 11), which comes with a corresponding seasonal card (Figure 12). After purchasing the gift packs, you can pick up the Four Seasons Tree Base Pack at the designated location in the supermarket. This approach not only increases the sales of fruits and vegetables in the supermarket but also involves more families in the interactive education of the Four Seasons Tree, encouraging children to actively participate in learning about fruits and vegetables.



*Figure 10. 24 Solar Terms display rack. Organises and presents products by the 24 solar terms, educating customers about traditional Chinese culture and promoting seasonal goods. work by author.*



*Fig. 11. 24 Treasure Seasonal Box. Contains seasonal fruits and vegetables for each of the 24 solar terms, promoting healthy eating and traditional Chinese culture. work by author.*



*Fig. 12. 24 Solar Terms Cards of the Seasonal Treasure Box. Each card includes imagery of the corresponding seasonal produce and traditional cultural information related to its solar term. work by author.*

### 3.3.3 Character Design

#### 3.3.3.1 Reference Styles and Inspiration for Colour Choices

When designing the characters, the author referred to the style and concepts of Pokémon and Digimon. The character designs of these works have a profound influence on my designs with their cute shapes, distinctive colours, and clean lines.

Pikachu from Pokémon is my main reference. Pikachu's design is simple and adorable, with its yellow body and red cheeks giving it a lively and friendly feel. Its rounded shape and big eyes make it look very approachable. Chubby, on the other hand, conveys sweetness and harmlessness with his round body, big eyes, and pink appearance.

In addition, Koemon from Digimon, portrayed as a monkey, inspired the design. These adorable characteristics are reflected in the character designs. By referring to the design styles of these classic characters, the character designs are not only more rounded and cute in their shapes but also more concise and aesthetically pleasing in their colour combinations and line treatments, enhancing the overall attractiveness and recognizability of the characters.



*Fig. 13.* Collection of Pokémon images. These images showcase various Pokémon, including classic characters and different types of Pokémon. Source:

<https://www.dypdf.com/1199.html>



*Fig. 14.* Koemon, a fictional creature from the Digimon series. Koemon resembles a small monkey and possesses the ability to manipulate its body size effortlessly. Image source:

<https://wikimon.net/Koemon>

Designer Bulma Illustrates specialises in flat design, using bold colours and clean lines to create vivid and playful characters. These characters are both childlike and artistically unique and have influenced my design style.

Helen Dardik is a professional illustrator, painter, and surface pattern designer. Her style is vibrant, folkloric, and fun, and can be described as “toomuchery.” Her illustrations are characterised by a lively and whimsical aesthetic, with bold and harmonious colours that have influenced the colour palette of my designs.



Fig. 15. Bulma Illustrates' flat design style. This illustration showcases her unique creation with bold colours and whimsical characters. Source: <https://www.instagram.com/bulma.illustrates/>



Fig. 16. Helen Dardik's art style. Her illustrations are characterised by lively and whimsical aesthetics with bold and harmonious colours. Source: <https://www.helendardik.com/mcc10ko7mri3l2qt8pee19btasanpn>

The Sichuan golden snub-nosed monkey, scientifically known as *Rhinopithecus roxellana*, is an endangered primate found mainly in the alpine forests of Sichuan, Gansu, and Shaanxi in China. They are known for their distinctive golden fur and blue faces. There are several reasons for choosing Sichuan golden snub-nosed monkeys as inspiration:

First, the Sichuan golden snub-nosed monkey is of great conservation importance. As an endangered species, the image of Sichuan snub-nosed monkeys can convey the educational significance of sustainable development and remind people of ecological protection and biodiversity. Secondly, the rounded shape and cute facial expression of the Sichuan snub-nosed monkey make it highly approachable. These features make the Sichuan snub-nosed monkey appear very friendly and approachable in character design, which is easy to be loved by children and adults.



Fig. 17. Golden Snub-Nosed Monkey. This species is known for its striking golden fur and blue face, and it is an inspiration for character design in this project. Source: [http://www.it86.org/sf\\_E6235A741081406EBB2A512C88DBB4F3\\_209\\_BE981819236.html](http://www.it86.org/sf_E6235A741081406EBB2A512C88DBB4F3_209_BE981819236.html)

### 3.3.3.2 Preliminary Sketches and Design Ideas

According to the above designer's style and inspiration for colour choices, the author's style is positioned as simple and cute, making it more suitable for children. For the selection of hues, a bold and bright palette is used to attract children's attention. To make the characters more closely aligned with the theme of the four seasons, costumes were designed for spring, summer, fall, and winter, then finalised the card front for 24 seasons.

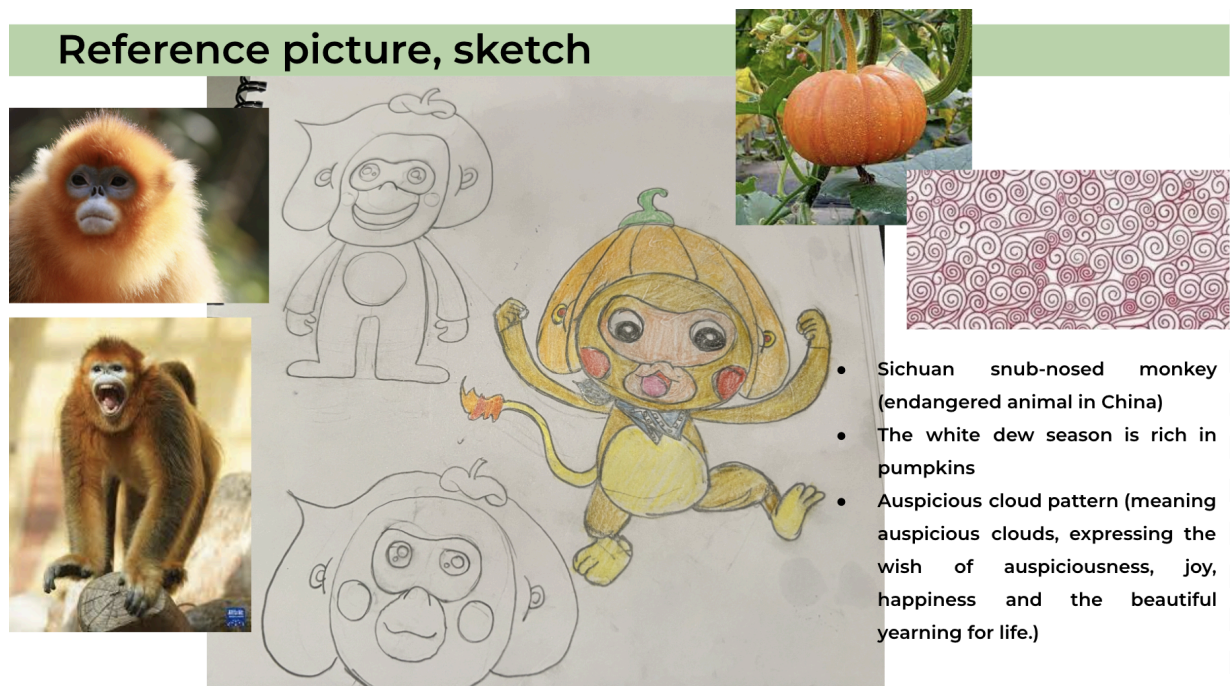


Fig. 18. Initial design of the Golden Snub-Nosed Monkey character. work by author.



Fig. 19. Preliminary 3D model of the monkey character. work by author.

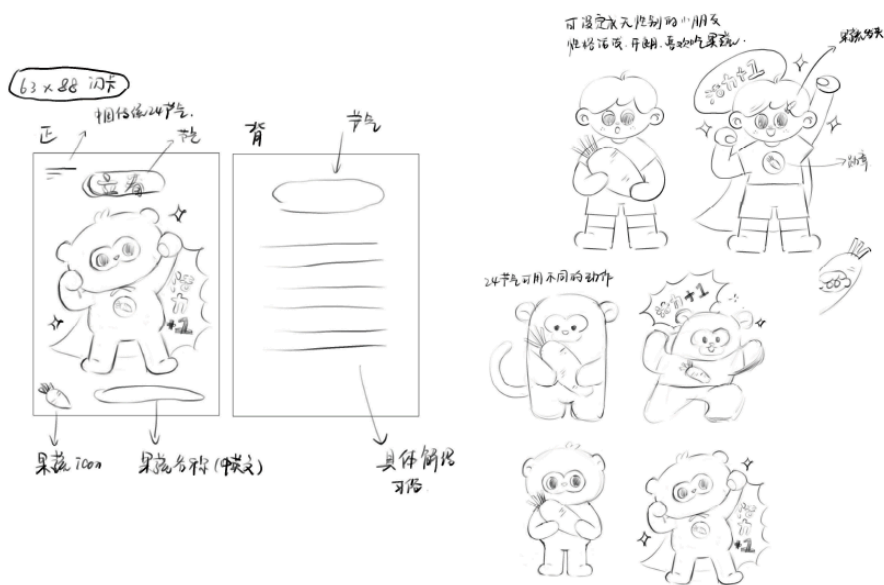


Fig. 20. Character concept development. These images showcase the thought process and iterations involved in developing the character, focusing on aspects such as colour schemes, clothing, and accessories. work by author.



Fig. 21. Character design sketches. These initial sketches outline the basic shapes, facial expressions, and poses for the characters inspired by the Golden Snub-Nosed Monkey. *work by author.*

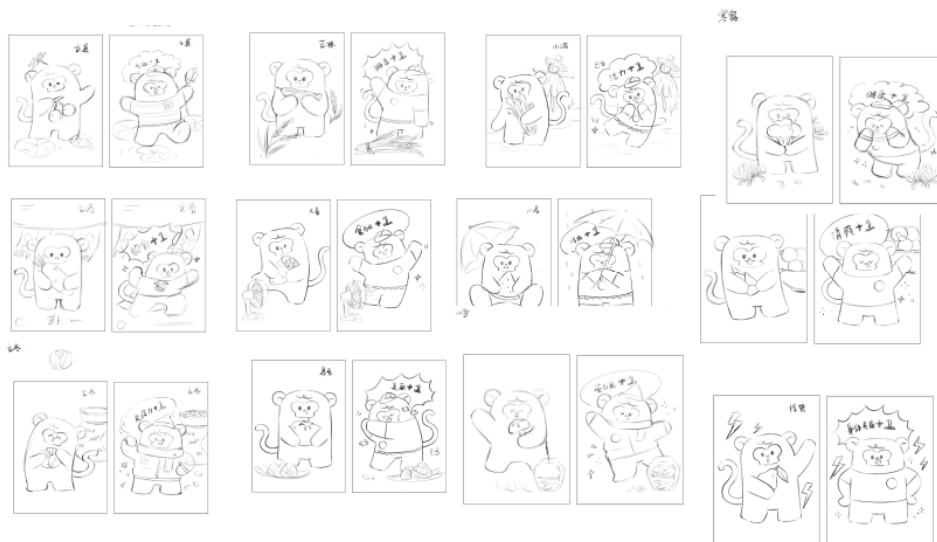


Fig. 22. Character design sketches. These initial sketches outline the basic shapes, facial expressions, and poses for the characters inspired by the Golden Snub-Nosed Monkey. *work by author.*

# S Spring

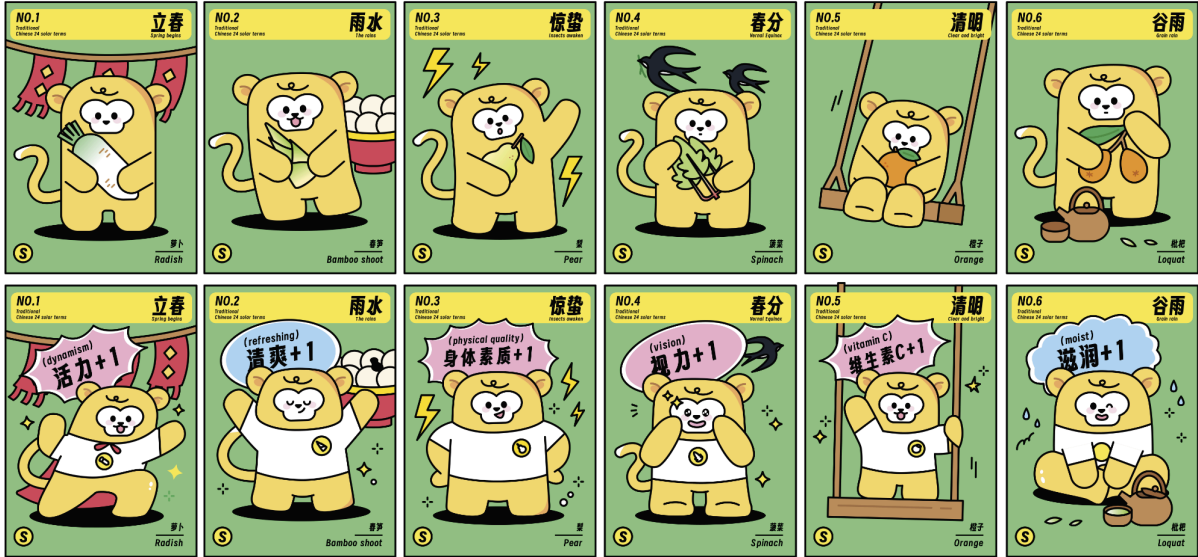


Fig. 23. Front side of the Spring cards for the 24 Solar Terms. work by author.

# S Summer

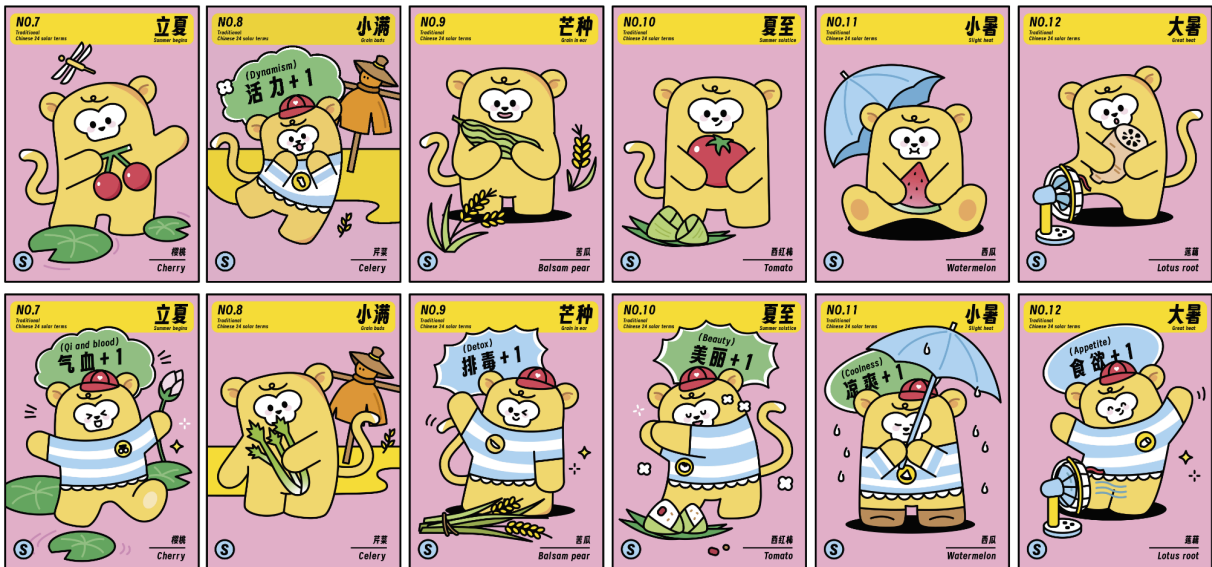


Fig. 24. Front side of the Summer cards for the 24 Solar Terms. work by author.

# A Autumn



Fig. 25. Front side of the Autumn cards for the 24 Solar Terms. work by author.

# W Winter

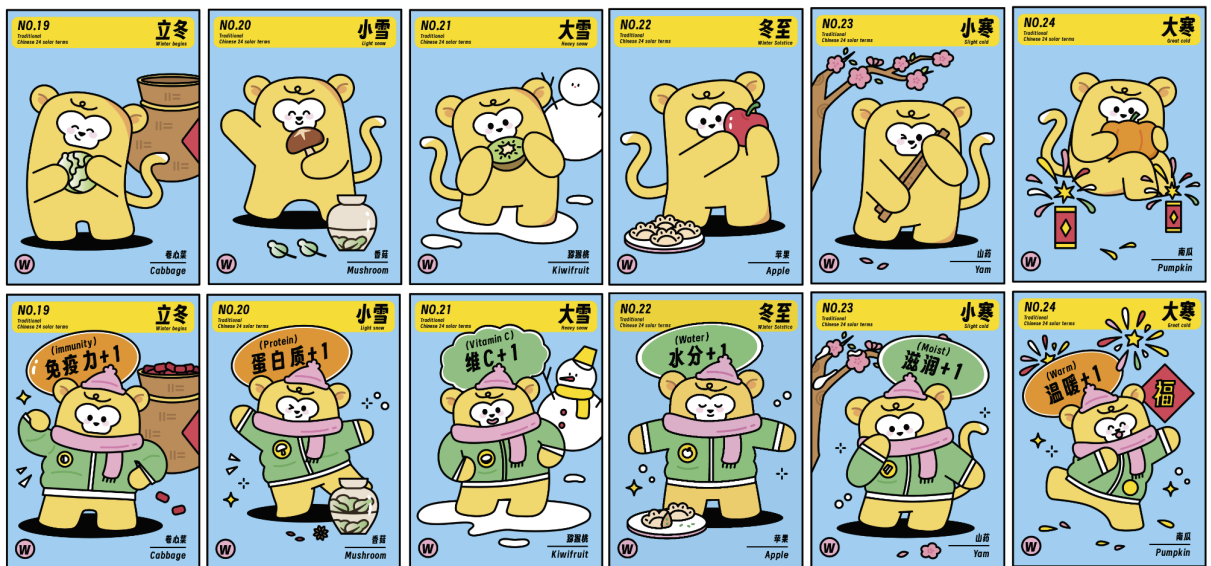


Fig. 26. Front side of the Winter cards for the 24 Solar Terms. work by author.

### **3.3.3.3 Detailed Analysis of Card Design**

The design of each of the 24 solar terms cards follows a unified style and structure to ensure visual consistency and educational effectiveness. The front of the card includes the following elements: The names and dates of the seasons are displayed at the top of the card, with both Chinese and English names and corresponding dates to help children remember the time points of the 24 seasons. The centre part features an image of the character holding the fruits and vegetables corresponding to that season, highlighting the characteristics of each season. The hues and backgrounds of the cards highlight the differences between each season, with the spring cards being green overall, pink in summer, orange in fall, and blue in winter. These hues and background patterns are not only aesthetically pleasing but also reinforce the theme of the seasons.

Several adjustments during the design process were made. For example, initially, the back of the card was all text content, but after testing and feedback, it was realised that replacing more text with pictures would be more appropriate for 7-10-year-olds. The final version of the card contains more pictures on the back, which not only conveys the message better but also increases children's interest and engagement. The information on the back of the cards includes the cultural practices of the seasons and the corresponding benefits of seasonal fruits and vegetables. Children will learn about the seasons while collecting the cards.

The success of this project lies not only in the attractiveness of the card design but also in the cooperation with the supermarket and the design of the Four Seasons Tree. Through collecting the cards, children will learn about the seasons and the benefits of seasonal fruits and vegetables, which will, in turn, influence their dietary habits and lead them to eat more fruits and vegetables on their own initiative. Through these designs and interactions, the program ultimately achieved the desired goal of educating children about traditional culture and promoting healthy eating habits.



Change the plan,  
use pictures instead  
of questions.

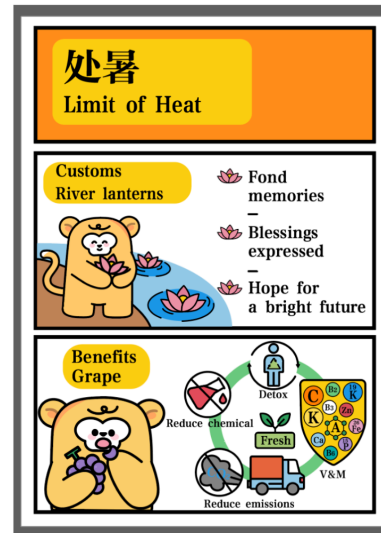


Fig. 27. The back of the card with more images replacing text. work by author.

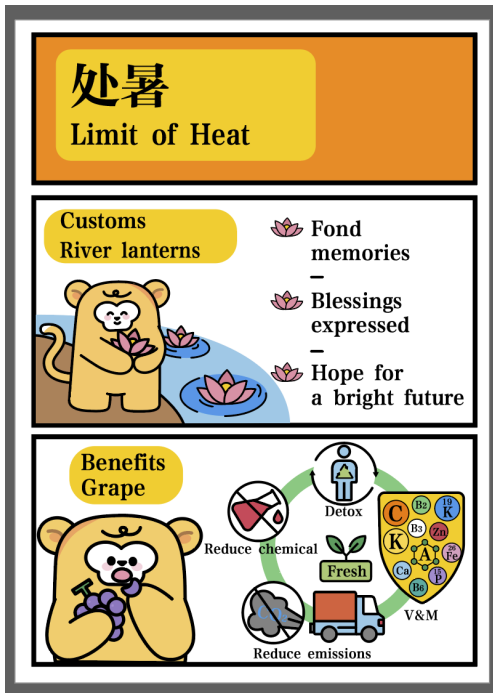


Fig. 28. Initial adjustments on the back of the card. work by author.

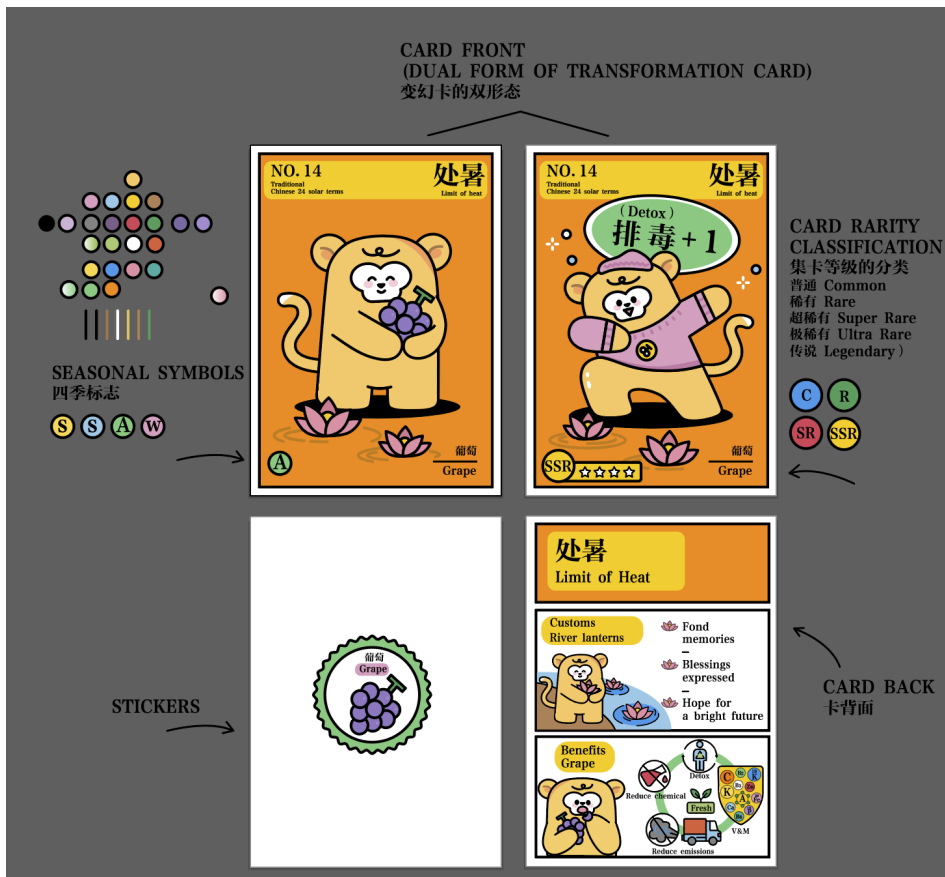


Fig. 29. Detailed diagram of the entire card. work by author.



Fig. 30. Collection of further adjustments and modifications for both front and back sides of the cards. work by author.

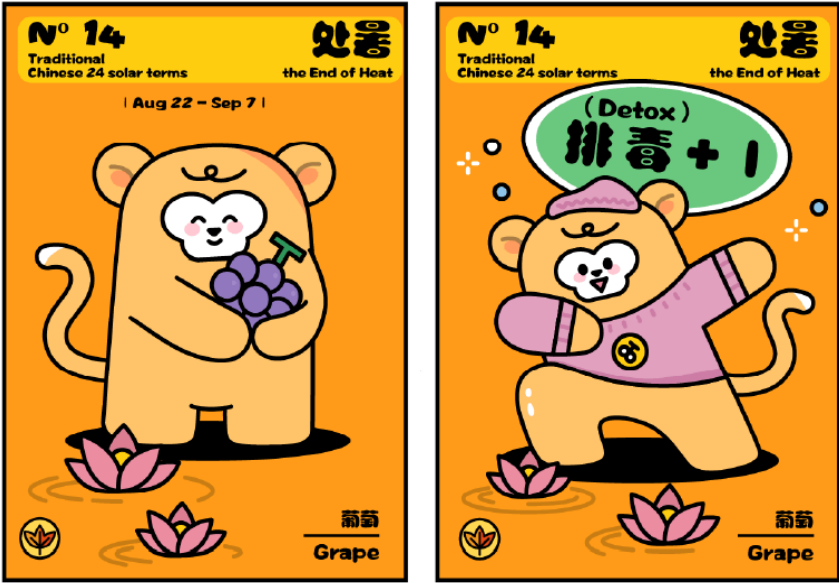


Fig. 31. Final front side design of the lenticular card (Laminated card). work by author.

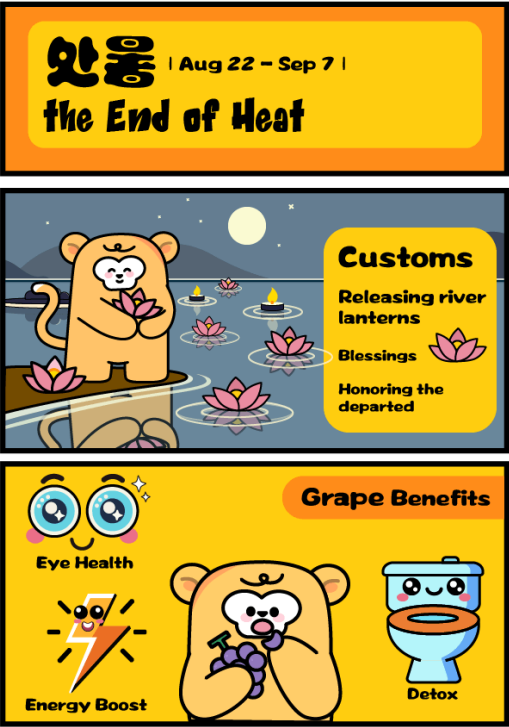


Fig. 32. Final back side design of the lenticular card. work by author.

## Final Physical Work



Fig. 33. The physical display of the Fruit and Vegetable Gift Pack. Design and photograph by author.



Fig. 34. Figure 3. The physical work of the 24 Solar Terms (Card front). Design and photograph by author.



Fig. 35. The physical work of the 24 Solar Terms (Card front). Design and photograph by author.



Fig. 36. The physical work of the 24 Solar Terms (Card back). Design and photograph by author.



Fig. 37. The physical work of the Bookmarks. Design and photograph by author.



Fig. 38. The bookmarks with slots for inserting the 24 Solar Terms. Design and photograph by author.



Fig. 39. The effect of inserting the 24 Solar Terms into the bookmark slots. Design and photograph by author.



Fig. 40. The effect of inserting the 24 Solar Terms into the bookmark slots. Design and photograph by author.



Fig. 41. The physical work of the Four Seasons Tree. Design and photograph by author.

## Chapter 4. Conclusion

The 24 Seasons Card Project engages children in learning about traditional Chinese culture and the benefits of seasonal fruits and vegetables by combining educational content with visually appealing elements. Through cooperation with supermarkets and the Seasonal Tree display, the project encourages children to actively collect the cards and learn about the seasons and the benefits of seasonal fruits and vegetables. In the process of collecting the cards, children are motivated to eat the fruits and vegetables, simultaneously learning about the traditional culture of the 24 seasons and understanding the relationship between seasonal fruits and vegetables and the 24 seasons. This approach not only promotes healthy eating habits but also enhances the educational experience, making learning fun and interactive. Through engaging design, interactive elements, and strategic collaboration, the project demonstrated its potential success and aimed to positively impact children's learning and behaviour.

This project provides future researchers with an effective example of how traditional culture can be combined with modern educational tools to motivate children and promote healthy eating habits. However, the project will also face challenges for implementation. While this design approach had the potential to help Chinese families improve their nutrition, could it successfully gain widespread support from the government, grocery stores, and families? It is also worth considering the cost of the project; will the high price limit its promotion and implementation?

...something like...implementation across China is beyond the scope of this design research....

Further research and improvements are needed for the project to achieve wider application and long-term impact. Through continuous feedback and optimisation, the project could be developed to help more families and children understand and practise healthy eating while passing on and promoting traditional Chinese culture.

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## Appendix A

立春 (2月3日 - 2月4日)

The first of the 24 solar terms is the Beginning of Spring. "Standing" signifies "beginning," and spring represents warmth and growth. Traditionally, the start of spring has auspicious connotations. In nature, it marks the recovery of all things. Representative vegetables and fruits for this period include radishes. It is customary for both adults and children to eat radish, a tradition known as "gnawing on spring" (CCTV).

雨水 (2月18日 - 2月19日)

The rains are the second solar term of the twenty-four solar terms. The rainy season usually indicates the beginning of rainfall and the gradual increase in rainfall. As the saying goes, "Spring rain is as precious as oil." The growth of all things requires rain to nourish them, so people often regard the rain in spring as particularly precious. The meaning of the rainy season is the beginning of rainfall, but the rainfall is mostly light or drizzle. Representative vegetables and fruits: spring bamboo shoots. Early spring is also the time when spring shoots emerge from the soil, the most tender and fresh, and spring shoots are one of the representative dishes of spring. Its cellulose content is also very rich, which can promote gastrointestinal peristalsis and remove oil. So eating spring bamboo shoots during the rainy season can help you taste the deliciousness of spring bamboo shoots and also aid in digestion and weight loss (CCTV).

惊蛰 (3月5日 - 3月6日)

Insects awaken is the third solar term among the twenty-four solar terms. Insects awake reflect the state in which natural organisms germinate and grow under the influence of rhythmic changes. "Zhe" refers to "hiding and lurking", where insects enter the soil for winter hiding and lurking; "Jing" refers to "awakening", and the spring thunder in the sky awakens the insects. The iconic feature of the Insects awaken solar term is the sudden movement of spring thunder and the vibrant vitality of all things. Representative vegetable and fruit: pear. In people's minds, the awakening of insects to eat pears symbolises separation from pests and staying away from diseases. Insects awaken a

variable temperature and a relatively dry climate, making it prone to dry mouth and tongue, as well as external coughing. Eating pears can benefit the spleen, calm the five internal organs, enhance physical fitness, and resist the invasion of bacteria (CCTV).

#### 春分 (3月20日 - 3月21日)

Vernal Equinoxes is the fourth solar term of spring. The meaning of "vernal equinox" is half, which means dividing one into two, dividing day and night equally, and balancing cold and heat. On the day of the spring equinox, the sun shines directly on the equator, with equal length of day and night, each lasting 12 hours. Representative vegetable and fruit: spinach. Eating spinach at the spring equinox has a moisturising and digestive effect. The carotene contained in spinach can be converted into vitamin A in the human body, which can protect vision and maintain the health of epithelial cells, and improve the body's ability to resist diseases (CCTV).

#### 清明 (4月4日 - 4月6日)

Clear and bright is the fifth solar term of spring. Clear and bright is a solar term that reflects the changes in natural phenology. During this time, the sun shines brightly, plants sprout, and flowers bloom, presenting a vibrant scene in nature. The earth presents a beautiful scene of spring and scenery, making it a good time for youth outings and tomb sacrifices in the suburbs. Representative vegetables and fruits: oranges. Oranges are rich in vitamin C, fructose, and carbohydrates. Eating more oranges during the Clear and bright Festival can stimulate appetite, promote healthy eating, and whiten the skin. It can also prevent colds and coughs, and relieve loss of appetite (CCTV).

#### 谷雨 (4月19日 - 4月20日)

Grain rain is the sixth solar term of the twenty-four solar terms and the last solar term of spring. The continuous spring rain is the main characteristic of the Grain Rain season. After the Grain Rain Festival, rainfall increases and the humidity in the air gradually increases, which is beneficial for the growth of crops. Representative vegetable and fruit: loquat. Before and after the Grain

Rain, it is a good season for the ripening of loquats. At this time, the loquats have a golden colour and soft and juicy flesh. Eating loquat can promote digestion, moisturise the skin, moisturise the lungs, relieve cough, and enhance immunity (CCTV).

#### 立夏 (5月5日 - 5月6日)

Summer begins is the seventh solar term among the twenty-four solar terms, and the first solar term of summer. After the beginning of summer, the sunshine increases, gradually warming up, and thunderstorms increase. Beginning of summer is an important solar term that marks the peak season of growth for all things. Adequate sunlight, suitable temperature, and abundant rainfall provide the necessary conditions for plants. Representative vegetables and fruits: cherries. Eating cherries on the day of the beginning of summer is also a traditional custom, representing the celebration of summer and the beginning of harvest. Cherries are a nutritious fruit that is rich in carbohydrates, vitamin C, vitamin K, and other nutrients. They have the effects of clearing heat and detoxifying, cooling blood and stopping bleeding, and adjusting qi and blood (CCTV).

#### 小满 (5月20日 - 5月22日)

Grain buds, the eighth solar term among the twenty-four solar terms, is also the second solar term in summer. During the Little Full Solar Term, the rainstorm in the south began to increase with frequent precipitation. During the Grain buds solar term in northern regions, there is less or even no rainfall. During the Grain buds season, most parts of China have entered summer one after another, and the temperature difference between the north and south has further narrowed. Representative vegetable and fruit: celery. Celery is one of the common vegetables in summer, rich in protein, carbohydrates, dietary fiber, and trace elements. After being full, the body is prone to producing moisture due to excessive rainfall. Eating celery regularly can effectively remove moisture from the body and relieve fatigue (CCTV).

#### 芒种 (6月5日 - 6月6日)

Grain in ear is the ninth solar term of the twenty-four solar terms and the third solar term of summer. This season has a significant increase in temperature, abundant rainfall, and high air humidity, making it suitable for planting cereal crops such as late rice. After this, the survival rate of planting will gradually decrease. This season is the time for planting rice in the south and harvesting wheat in the north. Representative vegetable and fruit: bitter melon. Eating bitter vegetables in the midsummer season is very beneficial for health and wellness. The bitterness of bitter melon can eliminate toxins in the body and reduce the burden on the liver. Rich in minerals, it has the effects of generating fluids, relieving heat, clearing the heart and improving eyesight, lowering blood pressure and fat, and promoting beauty and beauty (CCTV).

#### 夏至 (6月21日 - 6月22日)

The summer solstice is the 10th solar term of the 24 solar terms. At this time, the daylight hours in various parts of the Northern Hemisphere reach their longest throughout the year. High temperature, high humidity, and occasional thunderstorms are the weather characteristics after the summer solstice. Representative vegetables and fruits: tomatoes. Tomatoes are very common in daily life and are a seasonal ingredient in summer. They have a rich taste, are tender and juicy. Rich in carotenoids, vitamin C, and B vitamins, especially vitamin P, which ranks first in vegetables. It has functions such as moisturising the intestines, regulating blood pressure, and enhancing beauty and appearance (CCTV).

#### 小暑 (7月7日 - 7月8日)

Slight heat is the eleventh solar term of the twenty-four solar terms. Heat, which means hot, refers to mild heat and is not yet very hot. It is the period of the year when the temperature is highest, humid, and stuffy. Representative vegetable and fruit: watermelon. Watermelon is the king of summer fruits and vegetables, rich in water and vitamin C, which can quickly replenish the water and electrolytes lost due to sweating. It has the effects of clearing heat, relieving heat, diuresis, reducing swelling, and lowering blood pressure (CCTV).

### 大暑 (7月22日 - 7月23日)

Great heat is the twelfth solar term among the twenty-four solar terms and also the last solar term of summer. Great heat is relatively hot compared to Slight heat, and it is the hottest and most intense solar term of the year. Great heat, frequent thunderstorms, and typhoons. Representative vegetable and fruit: lotus root. Eating lotus roots in hot and dry weather can have the effects of nourishing yin, promoting body fluids, relieving restlessness, and quenching thirst. Moreover, there is a custom in the south to eat lotus roots during the Great Heat, especially when used for boiling soup, which can enhance appetite and promote digestion (CCTV).

### 立秋 (8月6日 - 8月9日)

Autumn begins is the thirteenth solar term of the twenty-four solar terms and also the beginning of autumn. It represents the start of the harvest season as grains begin to ripen. The term "autumn begins" also signifies a decrease in precipitation and humidity as the year transitions. From this point, yang energy gradually decreases, and all things become more introverted. Representative vegetable and fruit: eggplant. There is a saying, "Plant eggplants at the beginning of summer, and eat eggplants at the beginning of autumn." Eating eggplants during this time helps to lower body heat and eliminate autumn dryness (CCTV).

### 处暑 (8月22日 - 8月24日)

Limit of heat is the fourteenth solar term of the twenty-four solar terms. By the time of Limit of Heat, the scorching weather begins to end, although the weather remains hot, it shows a downward trend. Thunderstorm activity decreases, and the general trend of rainstorms weakens. There is a folk custom of releasing river lanterns on the day of the End of Heat. The river lantern, or "lotus lamp," symbolises the public's mourning for deceased loved ones and wishes for well-being. Representative vegetables and fruits: grapes. Grapes harvested at the end of summer and the beginning of autumn are abundant and rich in essential vitamins and minerals. They offer antioxidant properties, improve blood circulation, and help eliminate toxins and internal heat from the body (CCTV).

### 白露 (9月7日 - 9月8日)

White dews is the fifteenth solar term in the "24 solar terms". By this time, the summer monsoon has been replaced by the winter monsoon, ending the stuffy summer heat as the weather gradually turns cooler, with a widening temperature difference between day and night. Representative vegetable and fruit: cucumber. Due to the dry climate, eating cucumbers during White Dew can relieve dryness in the body and solve constipation problems (CCTV).

### 秋分 (9月22日 - 9月24日)

The autumnal equinox is the sixteenth solar term of the twenty-four solar terms. Known as "split", it signifies equal division or half, referring to equal day and night and dividing autumn into two. It used to be the traditional "festival of offering sacrifices to the moon", from which the Mid-Autumn Festival evolved. Representative vegetable and fruit: okra. Okra is rich in various vitamins and minerals, especially vitamin A and vitamin C, which are beneficial for protecting the eyes and skin (CCTV).

### 寒露 (10月7日 - 10月9日)

Cold dew is the seventeenth solar term of the twenty-four solar terms. It reflects climate change, with shorter days, longer nights, reduced sunshine, receding hot air, and rising cold air. The temperature difference between day and night is large, with a slight chill in the morning and evening. Representative vegetable and fruit: cauliflower. Cauliflower has significant lipid-lowering effects, rich in fiber, and helps prevent cardiovascular diseases by promoting gastrointestinal peristalsis and reducing fat absorption (CCTV).

### 霜降 (10月23日 - 10月24日)

Hoar-frost falls is the eighteenth solar term among the twenty-four solar terms. It signifies a sudden drop in temperature and the largest temperature difference between day and night. Representative vegetable and fruit: persimmons. During this time, persimmons are high in nutritional value,

moisturising the intestines, relieving constipation, moisturising the lungs, and enhancing skin health (CCTV).

#### 立冬 (11月7日 - 11月8日)

Winter begins is the nineteenth solar term of the twenty-four solar terms and the start of winter. It signifies the transition to a state of rest and collection, with the climate shifting from dry autumn to cold and rainy winter. Representative vegetable and fruit: cabbage. Winter is a high season for colds and constipation, making nutrient-rich cabbage an ideal choice to enhance immunity. Cabbage is rich in vitamin K, vitamin C, folic acid, and fiber, important for blood clotting and bone health (CCTV).

#### 小雪 (11月22日 - 11月23日)

Light snow is the twentieth solar term among the twenty-four solar terms, reflecting increased precipitation and colder temperatures with frequent cold waves. Representative vegetable and fruit: shiitake mushrooms. Shiitake mushrooms are low in calories, high in protein, and rich in vitamins, promoting calcium absorption and enhancing immunity (CCTV).

#### 大雪 (12月7日 - 12月8日)

Heavy snow is the twenty-first solar term among the twenty-four solar terms, marked by a significant drop in temperature and increased precipitation. Most parts of China enter a cold winter, with some northern regions experiencing temperatures below 0°C. Representative vegetable and fruit: kiwifruit. Rich in nutrients and vitamins, kiwifruit is ideal for boosting immunity and resisting winter viruses (CCTV).

#### 冬至 (12月21日 - 12月23日)

The Winter Solstice is the twenty-second solar term of the twenty-four solar terms, an important solar term and traditional ancestor worship festival in Chinese culture. It marks the beginning of the cold season. Representative vegetable and fruit: apples. Apples are high in moisture, vitamins, pectin, and fiber, helping to prevent dryness and aid digestion in winter (CCTV).

小寒 (1月5日 - 1月6日)

Slight cold is the twenty-third solar term among the twenty-four solar terms, characterised by cold but not extreme temperatures. Representative vegetable and fruit: yam. In winter, yam helps nourish and strengthen the spleen, resist cold, and prevent colds, making it suitable for dry weather symptoms (CCTV).

大寒 (1月19日 - 1月21日)

Great cold is the last solar term among the twenty-four solar terms, indicating extreme cold weather. Representative vegetable and fruit: pumpkin. Pumpkin is warm and sweet, nourishing the spleen and stomach, enhancing immunity, and preventing osteoporosis and high blood pressure (CCTV).