



United Nations  
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International Institute  
for Capacity Building  
in Africa

# Next Einstein Forum

## African Science Week

# Ethiopia Report



Addis Ababa, Ethiopia  
17 to 20 December 2018

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# Africa SCIENCE WEEK



NEXT EINSTEIN FORUM

An AIMS initiative in partnership with the



Robert Bosch  
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Education  
2030

# Next Einstein Forum

African Science Week

## Ethiopia Report

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## Introduction

Despite the fact that women have contributed to advancements in the prevention of cholera and cancer or expanded the understanding of brain development, many scientific fields remain male-dominated. According to the UNESCO Report Closing the Gap: Girls' and Women's Education in Science, Technology, Engineering and Mathematics (STEM) (2017), in Ghana, women make up less than a quarter of students enrolled in STEM degree courses, and the number of females obtaining bachelor's degrees in subfields like physics or engineering has declined over the past few years (Baker, 2013).<sup>1</sup>

UNESCO International Institute for Capacity Building in Africa (UNESCOIICBA), in partnership with the Next Einstein Forum (NEF), Ethiopia Young Academy of Sciences (EtYAS) and Jinka University, organized Africa Science Week (ASW) for Ethiopia on December 17-20, 2018. It brought together researchers, practitioners, teachers, teacher educators and students to raise awareness on science, technology, engineering, arts and mathematics (STEAM) education and recognize the importance of women in STEAM fields. Furthermore, it was designed to exchange views on good practices, challenges to women in STEAM, encourage girls and women to pursue their careers in science and create a long-running platform for the future development of science and technology in Ethiopia. The NEF ambassador for Ethiopia (2017-2019) is Dr. Binyam Sisay, Program Officer at UNESCOIICBA.

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1 Baker, D. 2013. What Works: Using Curriculum and Pedagogy to Increase Girls' Interest and Participation in Science. *Theory Into Practice*, 52(1), 14-20. doi: 10.1080/07351690.2013.743760

## Organizational Background

### Next Einstein Forum



Launched in 2013, NEF is an initiative of the African Institute for Mathematical Sciences in partnership with Robert Bosch Stiftung. NEF is a platform that connects science, society and policy in Africa and the rest of the world – with the goal to leverage science for human development globally. NEF believes that Africa's contributions to the global scientific community are critical for global progress and is working to make Africa a global hub for science and technology. ASW is a long-running initiative that first toured Africa in 2017, taking place at different times in nine African countries between June and July. In 2018, upon expansion to as many as 34 countries and the September opening in Zambia, Africa Science Week is for the first time brought to Ethiopia.

### UNESCO International Institute for Capacity Building in Africa

UNESCO IICBA, based in Addis Ababa, Ethiopia, was officially established by the UNESCO General Conference in October 1999. As the only UNESCO Category 1 Institute in Africa, it is tasked with strengthening the capacities of African Member States in achieving quality education through



interventions on teacher issues at all levels and in every aspect. The Institute works towards the Education 2030 Sustainable Development Goals and the African Union Continental Education Strategy for Africa (CESA) 2016-2025. In this regard, IICBA conducts its work through the African Regional Economic Communities and in partnership with other organizations supporting teacher development in Africa. By the nomination of the African Union Commission in 2017, IICBA is the coordinator of the Teacher Cluster of CESA 2016-2025.

### Ethiopian Young Academy of Sciences

EtYAS was established in 2015 with support from the Ethiopian Academy of Sciences and had 29 founding members. EtYAS' objectives include to identify, bring together and support the very best young scientists/scholars to champion excellence and innovation in national scientific research as well as promote interdisciplinary collaboration and representation among young scientists in Ethiopia. Its members are drawn from a wide variety of disciplines such as agriculture, engineering, health, natural and social sciences, and humanities.



### Jinka University

Established in 2017, Jinka University is one of the newest universities in Ethiopia striving to bring excellence in teaching, research and community



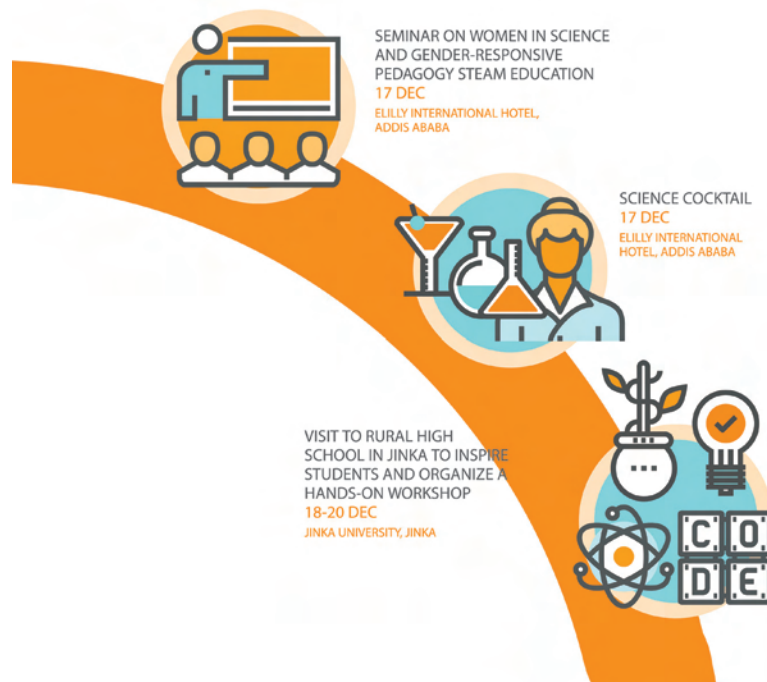
engagement in the country. It is located in the town of Jinka, the capital of South Omo Zone in the Southern Nations Nationalities and Peoples Regional State.

## Objectives

- To present and discuss good practice in STEAM education, focusing on the involvement of girls
- To recognize female scientists in Ethiopia and promote role models in STEAM fields
- To visit a rural high school and organize a hands-on workshop with high school students
- To organize a panel discussion with female university students in order to inspire and share experience

## Major Activities of Africa Science Week

The program consisted of three major activities. On 17 December 2018, Africa Science Week started with a seminar on “Women in Science and gender-responsive STEAM education” in Addis Ababa. In the evening of the same day, a Science and Technology Cocktail was organized with a panel discussion and presentations from Ethiopia’s foremost female scientists, coders and developers. Through 18-20 December 2018, a visit to Jinka, a small town in the South of Ethiopia, was planned to organize a panel discussion with students of Jinka University and a science demonstration for local high school students.



## 17 December 2018: Seminar on “Women in Science and gender-responsive STEAM education”

### Opening ceremony

Twenty-eight participants, including teachers, teacher trainers, educators, researchers and technical staffs of NEF and UNESCO IICBA, attended the event.

In the beginning, Dr. Binyam Sisay, the NEF ambassador of Ethiopia 2017-2019 and Program Officer for UNESCO IICBA, gave opening remarks, followed by greetings from the representative of NEF, Ms. Pearl Amina Karungi. The welcoming speech was delivered by Dr. Alemseged Beldado, Academic Vice President of Jinka University, who highlighted the critical importance of promoting girls and women in STEAM fields and shared with participants some of the opportunities and challenges that his university faces.

### Presentations

There were a total of six presentations that covered good practices in STEAM education, promoted role models and initiatives that recognize their importance, and discussed ways forward to achieve a leveled playing field for girls and women in STEAM areas. Three of the presentations came from Ethiopians, while two

presenters came from Zambia and Uganda, and one was given by IICBA.

The first presentation provided an introduction to the theme of the seminar. The next three covered gender-responsive pedagogy for STEM and classroom action, while the final two presentations covered women in science and the importance of mentoring. A brief description of each presentation is provided below.

#### **Gender-responsive STEM teaching and the role of ICT, e-learning**

##### **Mr. Tomas Danicek, UNESCO IICBA**

To kick off the seminar, Mr. Tomas provided the attendees with some concerning statistics to introduce the current situation of women’s and girls’ involvement in STEM fields. As part of his presentation, Mr. Tomas laid out some surviving stereotypes demotivating or obstructing girls in their potential pursuit of careers in STEM. To tackle those issues, using IICBA’s experience and achievements in countries like Rwanda, Ghana and Ethiopia, Mr. Tomas suggested to start orientating towards developing e-content that does not reinforce gender stereotypes like the old textbooks commonly

do. His recommendations include, among others, specially designed teaching methods deploying participatory principles and story-telling, systematic promotion of female role models and continuous fostering of networking and spreading of information about available scholarships.

### **Gender responsive pedagogy: Language use in a classroom and classroom interactions**

#### **Dr. Tizita Mulugeta, Center for Gender Studies, Addis Ababa University**

Dr. Tizita explained that language is an important tool of communication which expresses people's thoughts and beliefs and therefore must be used appropriately. Moreover, incorrect language use can deliver a negative message and discourage students. She demonstrated that girls are often cautioned that science subjects are for boys or too difficult for girls. Additionally, a boy who is not active in the class is thought to be behaving "like a girl" by teachers, which suggests that girls are assumed to be quiet, inactive and perform poorer than boys. According to these instances, gender biases are reflected in teachers' language, both explicitly and implicitly. Increasing students' performance can be achieved by using encouraging language in the classroom. Therefore, teachers should be self-aware of what kind of a language they use and how they act in the classroom so as to ensure gender responsiveness and encourage classroom participation of both boys and girls, especially girls.

### **Nurturing primary science and innovation for gender responsiveness through JETS as a foundation for STEM Learning: A case of Zambia**

#### **Mrs. Rabecca Musalaba Twelasi, National Science Centre, Zambia**

Mrs. Rabecca shared the experiences of Junior Engineers, Technicians and Scientists (JETS), a common club in most schools in Zambia and expounded upon its history, achievements and challenges. JETS was an extra-curricular STEM related program established in 1968. It mainly focuses on primary learners, contains various categories and subjects, and displays its research regularly. In addition, three findings from the JETS program were presented:

- Girls have good performance in schools
- Girls can be as good as boys in all activities
- The gap between boys and girls is closing

However, the current issue is that women are still not well represented in STEM fields. Limited education and high drop-out rates could be attributed to it, she explained. Besides, stalled innovation is also a challenge faced by JETS. The practices in Zambia have provided an inspiring model of cultivating interests in STEAM for primary learners, while pointing out current shortcomings and coming up with suggestions for the way forward.



## **Zara Yaqob, Descartes and Vico: mind, heart, and body fluids**

### **Dr. Surafel Wondimu, the Institute of Ethiopian Studies at Addis Ababa University**

While the previous presentations focused on practical aspects of STEAM education, Dr. Surafel provided a more philosophical perspective. His presentation posed several crucial questions. For instance, what science and humanities are, where the definitions come from and why western views and definitions are prevalent in the fields of science. Dr. Surafel underlined the significance of rethinking epistemological questions when discussing science and development. In other words, it should not be forgotten that “non-western” nations have their own understandings of science based on their contexts, even if the “West” has more advanced science and technology and therefore a hegemonic status in the field.

## **Thinking and practicing education through ‘womanhood’: Lessons from the past**

### **Ms. Netsanet Gebreichael, Makerere Institute of Social Research, Makerere University**

Ms. Netsanet shared the case of a nurse’s hospital in Ethiopia and how writing skills were essential in helping women’s voices be heard. Writing can not only pass on experiences to others, but also help to break gender stereotypes. Therefore, mentorship programs should

place an emphasis on writing training for women. In her presentation she mentioned that by looking at the past, the present and future have a lot to gain. This was building on the experience of the nursing publication done in Ethiopia in the 1980s. The publication gave the nurses the liberty to tell their stories, to express their ingenuity and develop themselves through co-authoring the publications. Through mentorship the women were able to support other women and give them a voice. It showed that mentorship should not be hierarchical but rather promote development.

## **Community-based role models for increased girls’ involvement in STEM: A case of Dream Nurturementorship program at Lira University, Northern Uganda**

### **Ms. Sharon Bright Amany, Lira University, Uganda**

Mentors for girls, it was thought, should be female so as to avoid a physical attraction between mentors and mentees, although there are a few male mentors. In this context, men and boys are not widely reached out to in the mentorship program and so the program is working to provide trainings to raise men’s awareness. She also addressed the importance of fundraising for sustainability of the program. Additionally, she demonstrated their efforts of building up more influential role models and expand impact to rural areas, which help to break community stereotypes of women studying STEM.

## Reflections on lessons learnt and the way forward

Dr. Binyam ended the seminar by briefly summarizing some of the key points raised during the workshop, which included:

- STEAM subjects are very important but close engagement with the social sciences and humanities is essential
- When we deal with issues of women in science, it should be remembered that empowering girls should begin from early childhood and continuously go up to higher education

- While it is important to study and work on practical challenges that hinder women from excelling in science and technology, it is also critical to deal with structural and systemic issues that are obstacles for women
- Teachers have a key role to play in any education system and investing in teachers and in gender-responsive pedagogy can bring about crucial changes

At the end, he extended his appreciation to NEF, UNESCO IICBA, EtYAS and Jinka University for their support and all the participants and presenters.



*Participants of the Seminar*

## 17 December 2018: Science and Technology Cocktail

In the evening, a Science and Technology Cocktail event was held to inspire high school girls and boys to pursue careers in STEAM. In addition, it provided them with a platform to network and obtain information about relevant initiatives and afterschool programmes.

Two high schools in Addis Ababa, Bole Preparatory School and Wondiyrad Secondary School, were invited to the Cocktail and each brought twelve girls and three boys accompanied by two teachers. Additionally, four

female scientists, Dr. Elizabeth Woldegiorgis, Dr. Helen Yifter, Dr. Teqarm Debebe and Dr. Yimtubezinash Woldeamanuel, came together to give panel discussion to students. The panel discussion was chaired by Dr. Mariamawit Yonatan, who is a co-Chair of EtYAS. Additionally, two successful young developers attended the event: Masresha Beniam from Omni Coders, an after-school coding programme for girls and Betelhem(Betty) Dessie, Project Manager at iCogs Labs and Founder of Anyone Can Code and Solve IT Program.



*Ethiopian Foremost Scientists and NEF Ambassador*

## Conversation and experience sharing with foremost Ethiopian scientists

Each of the four successful women scientists shared with the high school students their personal experience in relation to academic success and challenges that they have faced. They shared with the students how they have overcome some of the obstacles they have encountered and how important it is not to be discouraged by them. Students were also given the opportunity to ask questions to the panel.

## Inspiration, motivation and demonstration from within Ethiopia

Betty started coding when she was nine years old. After she first made money through her interest in coding, she became more confident and increasingly devoted to coding. This experience also motivated her to start her own business. By sharing this, she explained that it was an important and wonderful thing to be economically independent, which has given her much freedom in life. Pursuing her passions, making her own decisions and learning from mistakes have largely provided her with the true meaning of being an engaged person. “This is how technology has changed my life,” she said. Her presentation was a great inspiration for the young people in attendance who long to pursue a career in the fields of STEAM.



*Betelhem Dessie, Project Manager at iCogs Labs and Founder of Anyone Can Code and Solve IT Program*

## 18-20 December 2018: Visit to Inspire University and High School Students & Conduct a Hands-on Workshop

As part of the program, a visit to Jinka, a small town in Southern Ethiopia was organized for NEF and scholars from EtYAS and Addis Ababa University along with staff from IICBA. The trip included a visit to a local museum and a high school along with a panel discussion for Jinka University students and a science demonstration to students from three local high school. There were around 40 participants from Jinka University at the panel discussion and about 30 local high school students at the hands-on workshop.

### Visit to South Omo Research Centre Museum

On the first day of arrival, a visit to the South Omo Research Centre Museum was organized. Plenty of photographs, artifacts and practical items are displayed, demonstrating customs and cultures of 11 local tribes. As a research centre, academic studies on cultural anthropology are also demonstrated. Additionally, there are displays with interviews and discussions of the local women regarding bridehood and marriage, female circumcision, attributes of smart women and relationships.



*Participants of the Jinka Visit at the South Omo Research Centre Museum*

### Visit to a local high school in Jinka

The morning of 19 December was spent at a local high school. The Director showed the guests around the school, to classrooms, laboratories and the library. They visited the ICT room, where students were having an ICT class at the time of the visit. A group of students were learning how to use Microsoft Word. Several were reading textbooks online. The Director mentioned that all computers were received through support from partners and the government. However, the number of computers is limited.

The main challenge for the school, according to the Director, was a shortage of classrooms. Due to this, the school has established a shift system to accommodate the large number of students. This means that some students come to school in the morning, while others come in the afternoon. Aside from this, the Director discussed investments and attention from governments, expressing hope for more support in the future.



*The Director introduces the ICT room to participants*



*Students in the ICT room*



*The laboratory*

## Panel Discussion with Jinka University Students

A panel discussion was held with around 40 students from Jinka University. The discussion addressed how to promote women in science and included Dr. Adey Feleke of Addis Ababa University and EtYAS, Dr. Anabet Gedamu from EtYAS and Kotebe Metropolitan University and Dr. Moges Yigezu from Addis Ababa University on the panel with Dr. Binyam as the facilitator. The discussion highlighted the important role of women in science and the need to create better spaces for the promotion and engagement of women in science.



*Panelists during a discussion with students of Jinka University*

## Hands-on workshop with students from three high schools

To further inspire future Einsteins, Dr. Adey and Dr. Andebet facilitated a hands-on workshop for about 30 students from three local high schools. Dr. Andebet acknowledged that for rural communities, like Jinka, access to STEM apparatuses can be challenging. Therefore, he showed them how to create resources using locally accessible everyday materials, like plastic bottles, wood and straws, etc. This spurred the minds of the students to begin to see everyday materials around them as potential instruments to conduct experiments and potentially solve problems.



*Participants of the panel discussion at Jinka University*



*The hands-on workshop*


Dr. Adey then explained the process of pigmentation and role of chlorophyll in aiding photosynthesis plants and demonstrated the process of separation of chlorophyll in plants using acetone to extract chlorophyll A and B. She also explained and demonstrate the reaction of eggs in vinegar, resulting in removal of the egg membrane.



*Dr. Adey performs the process of pigmentation*

# Ethiopia

17-20 DEC 2018




## Africa SCIENCE WEEK


NEXT EINSTEIN FORUM

An @ AMIS initiative in partnership with the Robert Koch Stiftung


### Igniting the Power of Science




SEMINAR ON WOMEN IN SCIENCE  
AND GENDER-RESPONSIVE  
PEDAGOGY STEAM EDUCATION  
17 DEC  
ELILLY INTERNATIONAL HOTEL,  
ADDIS ABABA



SCIENCE COCKTAIL  
17 DEC  
ELILLY INTERNATIONAL  
HOTEL, ADDIS ABABA







VISIT TO RURAL HIGH  
SCHOOL IN JINKA TO  
INSPIRE STUDENTS AND  
ORGANISE A HANDS-ON  
WORKSHOP  
18-20 DEC  
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# Annex: Program Agenda

December 17, 2018	
1st part: Seminar on Women in Science and gender-responsive STEAM education	
09:00–09:20	<b>Arrival and Participant Registration</b>
09:20–09:50	<p><b>Opening remarks</b> Dr. Binyam Sisay, Program Officer, UNESCOIICBA</p> <p><b>Greetings from Next Einstein Forum</b> Ms. Pearl Amina Karungi</p> <p><b>Welcoming Speech</b> Dr. Alemseged Beldados, Academic Vice President, Jinka University</p>
09:50–10:30	<p><b>Session 1: Introduction to the theme</b> <b>Facilitator:</b> Dr. Adey Feleke, EtYAS and Addis Ababa University</p> <p><b>Gender-responsive STEAM teaching and the role of ICT, e-learning</b> <b>Presenter:</b> Mr. Tomas Danicek, Volunteer, UNESCOIICBA</p>
10:30–11:00	<b>Coffee break</b>
11:00–13:00	<p><b>Session 2: Gender-responsive pedagogy for STEM, classroom action</b> <b>Facilitator:</b> Dr. Moges Yigezu, Department of Linguistics, Addis Ababa University</p> <p><b>1. Gender responsive pedagogy: Language use in a classroom and classroom interactions</b> <b>Presenter:</b> Dr. Tizita Mulugeta, Center for Gender Studies, Addis Ababa University</p> <p><b>2. Nurturing primary science and innovation for gender responsiveness through JETS as a foundation for STEM Learning: A case of Zambia</b> <b>Presenter:</b> Mrs. Rabeca Musalaba Twelasi, Technical Officer, National Science Centre, Zambia</p> <p><b>3. Zara Yaqob, Descartes, and Vico: Mind, Heart and Body Fluids</b> <b>Presenter:</b> Dr. Surafel Wondimu, Institute of Ethiopian Studies, Addis Ababa University</p>
13:00–14:00	<b>Group photo and lunch break</b>

<b>14:00–16:00</b>	<p><b>Session 3: Women in science and importance of mentoring, role models</b>  <b>Facilitator:</b> Mr. Ononju Okwaraogoma, Consultant, UNESCOIICBA</p> <p><b>1. Thinking and practicing education through ‘womanhood’: Lessons from the past</b>  <b>Presenter:</b> Ms. Netsanet Gebremichael, Makerere Institute of Social Research, Makerere University</p> <p><b>2. Community-based role models for increased girls involvement in STEM: A case of Dream Nurture mentorship program at Lira University, Northern Uganda</b>  <b>Presenter:</b> Ms. Sharon Bright Amanya, Lira University, Uganda</p>
<b>16:00–16:15</b>	<p><b>Reflections on lessons learnt and the way forward</b>  Dr. Binyam Sisay</p>
<b>16:15–16:30</b>	<p><b>Coffee break</b></p>
<h2>2nd part: Science Cocktail and Networking</h2>	
<b>17:00–19:30</b>	<p><b>Convesation and Experience Sharing with foremost Ethiopian female scientists</b>  <b>Facilitator:</b> Dr. Mariamawit Yonathan, EtYAS and Addis Ababa University</p> <p>Distinguished invitees:</p> <ol style="list-style-type: none"> <li><b>1. Dr. Elizabeth Woldegiorgis</b></li> <li><b>2. Dr. Helen Yifter</b></li> <li><b>3. Dr. Teqwam Debebe</b></li> <li><b>4. Dr. Yimtubezinash Woldeamanuel</b></li> </ol> <p><b>Question and Answer Session</b></p> <p><b>Storytelling and Motivation</b></p> <ul style="list-style-type: none"> <li>- Betty Dessie, iCog Labs Project Manager and Solve IT Program Founder</li> <li>- Masresha Beniam, Omni Coders, after school program for girls</li> <li>- Demonstration by groups of girls that have developed mobile and web applications to: <ul style="list-style-type: none"> <li>o help the blind to text and call</li> <li>o find doctor prescribed medicine as soon as possible</li> <li>o access information and learning material for studying</li> </ul> </li> </ul>

3rd part: Visit to Inspire University and High school Students & Hands-on Workshop	
December 18, 2018	
<b>Afternoon</b>	Arrival in Jinka
<b>16:00–17:00</b>	Visit to South Omo Research Centre and Museum
December 19, 2018	
<b>08:30–09:30</b>	Visit to a rural high school in Jinka
Panel Discussion with Jinka University Students	
<b>10:00–12:30</b>	<p><b>Opening remarks</b> Ms. Aregash Gabzew Lecturer and Director, Directorate for Women, Youth and Children Office, Jinka University</p> <p><b>Greetings from Next Einstein Forum</b> Ms. Pearl Amina Karungi</p> <p><b>Panel Discussion on how to promote women in sciences</b> <b>Facilitator:</b> Dr. Binyam Sisay, Program Officer, UNESCOIICBA</p> <p><b>Panelists:</b> Dr. Adey Feleke, EtYAS and Addis Ababa University Dr. Anebet Gedamu, EtYAS and Kotebe Metropolitan University Dr. Moges Yigezu, Addis Ababa University</p>
Hands-on Workshop with High School Students	
<b>14:00–17:00</b>	<p><b>Opening remarks</b> Ms. Aregash Gabzew, Lecturer and Director, Directorate for Women, Youth and Children Office, Jinka University</p> <p><b>Greetings from Next Einstein Forum</b> Ms. Pearl Amina Karungi</p> <p><b>Facilitators:</b> Dr. Adey Feleke, EtYAS and Addis Ababa University Dr. Anebet Gedamu, EtYAS and Kotebe Metropolitan University</p>
December 20, 2019	
<b>Afternoon</b>	Departure



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